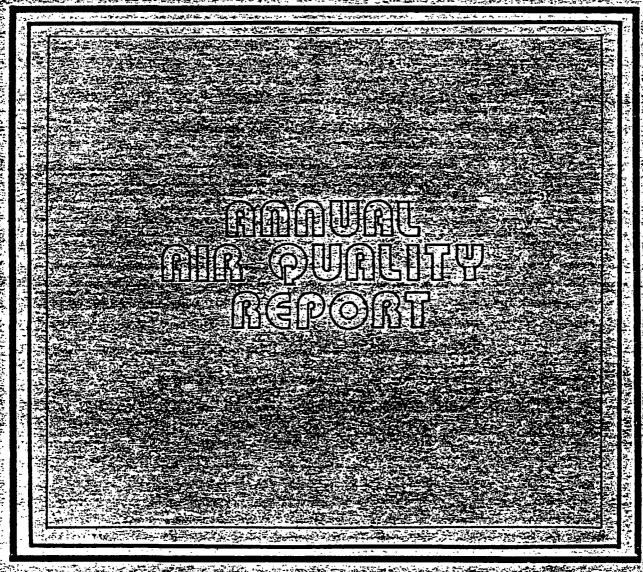
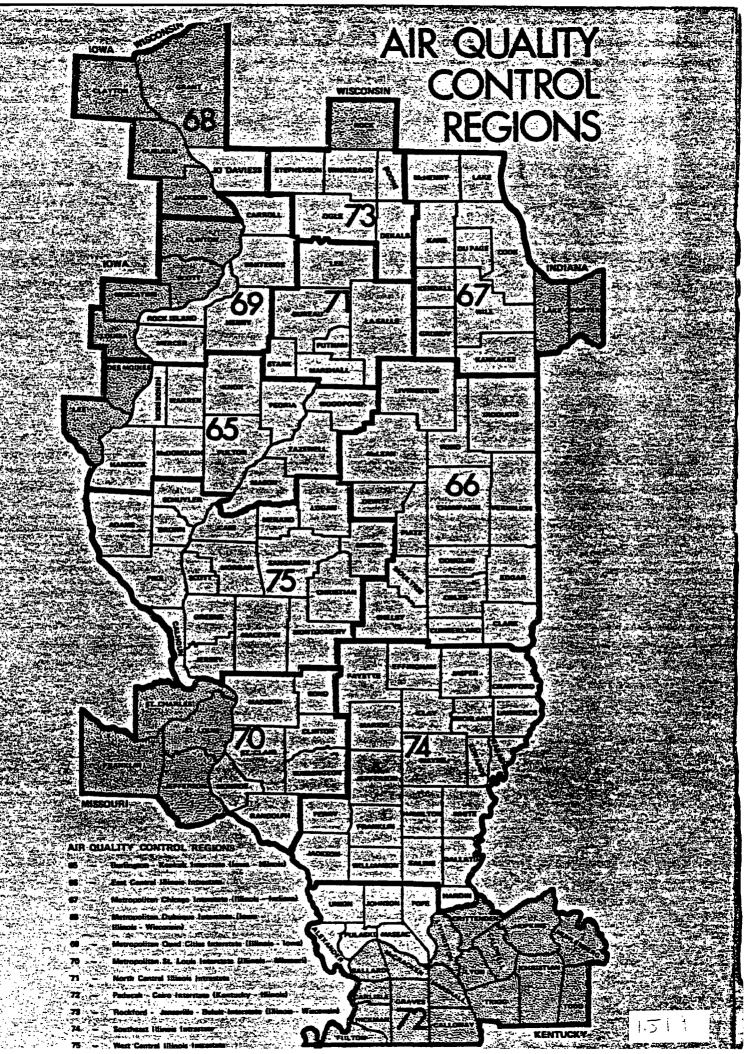
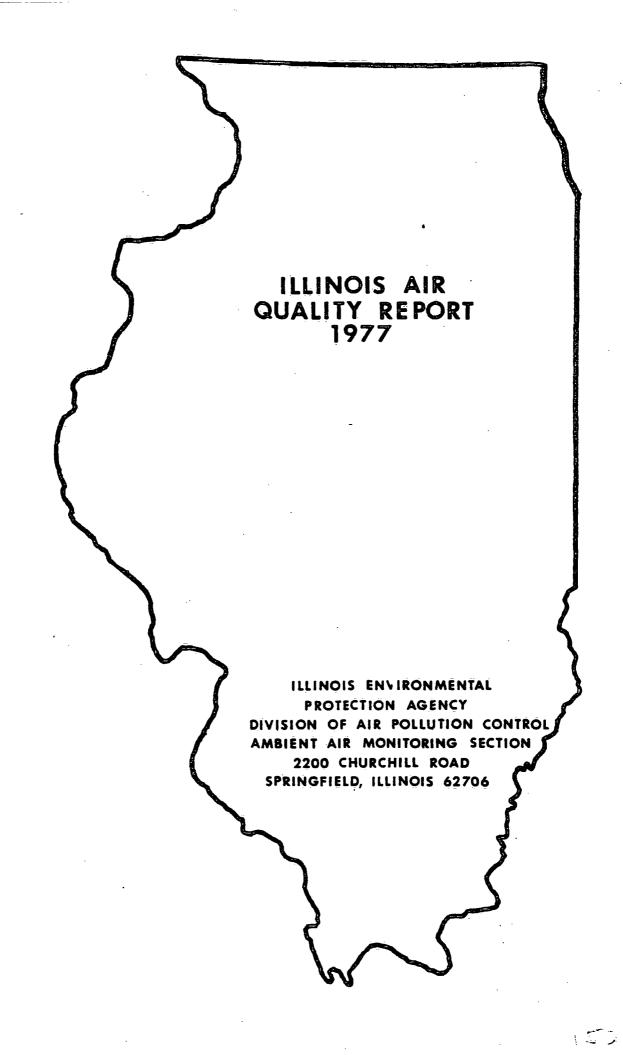
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FOREWARD

The 1977 Annual Air Quality Report has been prepared using a format similar to previous years. Notable additions to this year's report are a section devoted to industrial data and one presenting metals data. Both of these sections, though new to the report, are expected to expand significantly in the future with increased emphasis in both areas. During calendar year 1978, the industrial data base in Illinois is expected to increase to the point where the number of industrial total suspended particulate sites is equivalent to that in the statewide network, while the number of industrial sulfur dioxide monitors will be three times the number of those operated by the State and local agencies. Data gathered in these industrial networks will aid in the preparation of a more complete profile of air quality in Illinois.

The Illinois Environmental Protection Agency is embarking on a program of analyzing samples from all of its total suspended particulate sites for the metals nickel, iron, zinc, cadmium, lead, arsenic, copper, manganese and chromium. This program, coupled with the Cook County Department of Environmental Control metals analysis effort and that of the City of Chicago, will provide critical data for the major metropolitan areas of the State.

Quality assurance has become a common term in the air monitoring field in recent years. Progress has been made in the refinement of the Illinois Quality Assurance Program to the point where more inspections and audits were made in 1977 than in any previous year. The result of this effort is that more confidence can be placed in the data generated by the monitoring network. Continued emphasis will be placed on this program in the coming year with plans for including several large industrial networks already in the inspection schedule.

Our sincere appreciation is extended to all who have cooperated in the collection of the data contained in this report. This includes the individuals, as well as the Agencies, who have dedicated themselves to the operation of the monitoring network. Of special note here are the industrial concerns who have provided the data presented in Section 6.

We welcome your suggestions, comments and criticisms and have provided a form letter for your convenience.

Copies of this report can be obtained by writing to the Ambient Air Monitoring Section, Illinois Environmental Protection Agency, 2200 Churchill Road, Springfield, Illinois 62706.

David J. Kolaz, P.E.

Manager

Ambient Air Monitoring Section

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Winnebago Co. Department of Public Health 401 Division Rockford, Illinois 61108 (815) 987-2560

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. 1.0 AIR QUALITY STANDARDS AND EPISODE LÉVELS

The National Ambient Air Quality Standard (NAAQS) currently in effect are shown in Table 1. The Ambient Air Quality Standards, promulgated by the State of Illinois, are identical to the NAAQS. In addition to the Air Quality Standards, episode levels have been established to protect the public from ambient air concentrations which may result from short-term adverse conditions. These levels are shown in Table 2. The following are the Air Quality Standards as adopted by the Illinois Pollution Control Board and which are contained in Chapter 2 of the Illinois Pollution Control Board's Air Pollution Control Regulations.

EXCÉPT ÀS HEREINAFTER STATED AND UNLESS À DIFFERENT MEANING OF À TERM IS CLEAR FROM ITS CONTEXT, THE DEFINITIONS OF TERMS USED IN THIS CHAPTER SHALL BE THE SAME AS THOSE USED IN THE ENVIRONMENTAL PROTECTION ACT.

ALL TERMS DEFINED IN PARTS 1 AND 2 OF THIS CHAPTER WHICH APPEAR IN PART 3 OF THIS CHAPTER HAVE THE DEFINITIONS SPECIFIED BY RULE 101 OF PART 1 OR RULE 201 OF PART 2 OF THIS CHAPTER.

Rule 301: Preamble. Air quality standards are limits on atmospheric concentrations of air contaminants established for the purpose of protecting public health and welfare. The levels of air quality designated by the standards are designed to protect against injury to human, plant or animal life and they are further intended to allow maximum enjoyment of life and property consistent with the intent of the Environmental Protection Act.

The first use of our air resources is to sustain life. Air entering the respiratory tract must not menace health. Therefore, the air quality standards set must, as a minimum, provide air which will not adversely affect, through acute or chronic symptoms, the health of the community. Adverse health effects include not only the possible production and aggravation of disease, but also interference with bodily functions. The standards have also taken into account soiling, corrosion, vegetation damage and other human effects.

The standards are more than goals. They are legally enforceable limitations, and any person causing or contributing to a violation of the standards is subject to enforcement proceedings under the Act. The standards have also been designed for use as a basis for the development of implementation plans by State and local agencies for the abatement and control of pollutant emissions from existing sources, and for the determination of air contaminant emission limitations to ensure that population and economic growth trends do not add to the region's air pollution problems.

Rule 302: Applicability.

The standards in this part are applicable throughout the State of Illinois, except as otherwise in this part provided.

Rule 303: Nondegradation.

Existing ambient air quality which is better than the established ambient air quality standards at the date of their adoption will be maintained in its present high quality. Such ambient air quality shall not be lowered unless and until it is proved to the Agency that such change is justifiable as a result of necessary economic and social development and will not interfere with or become injurious to human health or welfare.

Rule 304: Effective Date.

The standards of this Part 3 shall become effective ten days after such Part is filed with the Secretary of State.

Rule 305: Monitoring.

Pollution levels will be determined by fixed or mobile sampling stations beyond the premises on which a source is located. Stations will be located according to the guidelines for establishing monitoring networks as developed by the National Air Pollution Control Administration.

Rule 306: Reference Conditions.

All measurements of air quality are corrected to a reference temperature of 25°C, and to a reference pressure of 760 millimeters of mercury (1.013.2 millibars).

Rule 307: Particulates.

- (a) Standards.
 - (1) <u>Primary Standards</u>. The primary ambient air quality standards for particulate matter are:
 - (A) an annual geometric mean concentration of 75 micrograms per cubic meter; and,
 - (B) a maximum 24-hour concentration not to be exceeded more than once per year of 260 micrograms per cubic meter.
 - (2) <u>Secondary Standards</u>. The secondary ambient air quality standards for particulate matter are:
 - (A) an annual geometric mean concentration of 60 micrograms per cubic meter; and,
 - (B) a maximum 24-hour concentration not to be exceeded more than once per year of 150 micrograms per cubic meter.

(b) Measurement Method. For determining conformance with particulate air quality standards, particulate matter shall be measured by the high volume sampler method as described in 36 Federal Register pp. 22388-22390, November 25, 1971, or by an equivalent method approved by the Agency.

Rule 308: Sulfur Oxides (Sulfur Dioxide).

- (a) Primary Standards. The primary ambient air quality standards for sulfur oxides measured as sulfur dioxide are: (A) an annual arithmetic mean concentration of 80 micrograms per cubic meter (0.03 ppm); and (B) a maximum 24-hour concentration not to be exceeded more than once per year of 365 micrograms per cubic meter (0.14 ppm).
- (b) <u>Secondary Standard</u>. The secondary ambient air quality standard for sulfur oxides measured as sulfur dioxide is a maximum 3 hour concentration not to be exceeded more than once per year of 1,300 micrograms per cubic meter (0.5 ppm).
- (c) Measurement Method. For determining conformance with sulfur oxide air quality standards, sulfur oxides shall be measured as sulfur dioxide by the paraosaniline method as described in 40 CFR Part 50, National Primary and Secondary Ambient Air Quality Standards, Appendix A, or by an equivalent method of proof approved by the Agency.

Rule 309: Non-methane Hydrocarbons.

- (a) Standard. The ambient air quality standard for non-methane hydrocarbons, measured as methane, is 160 micrograms per cubic meter (0.24 ppm) maximum 3-hour concentration (6 to 9 a.m.) not to be exceeded more than once per year.
- (b) Measurement Method. For determining conformance with the non-methane hydrocarbon air quality standard, hydrocarbons shall be measured by the hydrogen flame ionization detector technique as described in 36 Federal Register, pp. 22394-22396, November 25, 1971, or by an equivalent method approved by the Agency.

Rule 310: Carbon Monoxide.

- (a) <u>Standards</u>. The ambient air quality standards for carbon monoxide are:
 - (1) a maximum 8-hour concentration not to be exceeded more than once per year of 10 milligrams per cubic meter (9 ppm); and,
 - (2) a maximum 1-hour concentration not to be exceeded more than once per year of 40 milligrams per cubic meter (35 ppm).
- (b) Measurement Method. For determining conformance with the carbon monoxide air quality standard, carbon monoxide shall be measured

by the non-dispersive infrared spectrometry technique as described in 36 Federal Register, pp. 22391-22392, November 25, 1971, or by an equivalent method approved by the Agency.

Rule 311: Nitrogen_Dioxide.

- (a) Standards. The ambient air quality standard for nitrogen dioxide is an annual arithmetic mean concentration of 100 micrograms per cubic meter (0.05 ppm).
- (b) Measurement Method. For determining conformance with the nitrogen dioxide air quality standard, nitrogen dioxide shall be measured by the colorimetric method as described in 35 Federal Register, pp. 22396-22397, November 25, 1971, or by an equivalent method approved by the Agency.

Rule 312: Photochemical Oxidants.

- (a) Standard. The ambient air quality standard for photochemical oxidants is 160 micrograms per cubic meter (0.08 ppm) maximum 1-hour concentration not to be exceeded more than once per year.
- (b) Measurement Method. For determining conformance with the photochemical oxidants air quality standard, photochemical oxidants shall be measured by the ozone-ethylene reaction method as described in 36 Federal Register, pp. 22392-22393, November 25, 1971, or by an equivalent method approved by the Agency.

TABLE 1
SUMMARY OF NATIONAL AND ILLINOIS
AMBIENT AIR QUALITY STANDARDS

POLLUTANT	TIME OF AVERAGE	PRIMARY STANDARD (AT 25 ⁰ C and 760 mm of Hg)	SECONDARY STANDARD
PARTICULATE MATTER (TSP)	Annual Geometric Mean 24 hour	75 ug/m ³ 260 ug/m ³	60 ug/m ³ 150 ug/m ³
SULFUR DIOXIDE (SO ₂)	Annual Arithmetic Mean 24 hour 3 hour	0.03 ppm (80 ug/m ³) 0.14 ppm (365 ug/m ³) None	None None 0.5 ppm (1300 ug/m ³)
CARBON MONOXIDE (CO)	8 hour 1 hour	9 ppm (10 mg/m ³) 35 ppm (40 mg/m ³)	Same as Primary Same as Primary
PHOTO-CHEMICAL OXIDANTS (03)	1 hour	· 0.08 ppm (160 ug/m ³)	Same as Primary
NON-METHANE Hydrocarbons (N-MHC)	3 hour (6 to 9 AM)	0.24 ppm (160 ug/m ³)	Same as Primary
NITROGEN DIOXIDE (NO ₂)	Annual Arithmetic Mean	0.05 ppm (100 ug/m ³)	Same as Primary

¹ Illinois Air Quality Standards are identical to National Air Quality Standards.

NOTE: All standards with averaging time of 24 hours or less are not to be exceeded more than once per year.

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AIR POLLUTION EPISODE LEVELS

POLLUTANT	WATCH	YELLOW ALERT	RED ALERT	EMERGENCY
SUSPENDED PARTICULATE MATTER (TSP)	2 hour 5 COH-625 ug/m ³	24 hour 3 COH-375 ug/m ³	24 hour 5 COH-625 ug/m ³	24 hour 7 COH-875 ug/m ³
SULFUR DIOXIDE (SO ₂)	2 hour 0.30 ppm	4 hour 0.30 ppm	4 hour 0.35 ppm	4 hour 0.40 ppm
PRODUCT (SO ₂ x TSP)	2 hour 1.0	4 hour _1.0 24 hour 0.20	4 hour 2.0 24 hour 0.80	4 hour 2.4 24 hour 1.20
CARBON MONOXIDE (CO)	2 hour 30 ppm	8 hour 1:5 ppm	8 hour 30 ppm	8 hour 40 ppm
PHOTO-CHEMICAL OXIDANTS (03)	(ADVISORY) 2 hour 0.07 ppm	1 hour .17 ppm	1 hour .30 ppm	1 hour .50 ppm
NITROGEN DIOXIDE (NO ₂)	2 hour 0.40 ppm	1 hour 0.60 ppm 24 hour 0.15 ppm	1 hour 1.20 ppm 24 hour 0.30 ppm	l hour 1.60 ppm 24 hour 0.40 ppm
NON-METHANE HYDROCARBONS (N-MHC)	None	None	None	None

2.0 HEALTH AND WELFARE EFFECTS OF AIR POLLUTANTS

2.1 PARTICULATE MATTER

All air pollutants are not in the gaseous form. Small solid particles and liquid droplets, collectively called particulates or aerosols, are also present in the air in great numbers, and may constitute a pollution problem. Particulates entering the atmosphere differ in size and chemical properties. The effects of particulates on health and welfare are directly related to their size and chemical composition.

Particulate matter in the atmosphere consists of solids, liquids, and/or liquids-solids in combination. Suspended particulates generally refer to particles less than 100 microns in diameter (human hair is typically 100 microns thick) since larger particles will settle out of the air under the influence of gravity in a short time.

Typical sources emitting particles into the atmosphere are combustion of fossil fuels (ash and soot), industrial processes (metals, fibers, etc.), fugitive dust (wind and mechanical erosion of local soil) and photochemically produced particles (complex chain reactions between sunlight and gaseous pollutants). Combustion and photochemical products tend to be smaller in size (less than 1 micron); whereas fugitive dust and industrial products are larger in size (greater than 1 micron).

One of the major problems associated with high concentrations of particulates is that the interaction between the particles and sunlight can potentially result in climatic effects and diminished visibility (smog and haze). Particles play a key role in the formation of clouds, and emissions of large numbers of particles can, in some instances, result in local increases in cloud formation and precipitation. Particles in the size range of 0.1 to 1.0 microns are the most efficient in scattering visible light (wavelength 0.4 to 0.7 microns) thereby reducing visibility. Particles combined with high humidity can result in the formation of haze or smog, which can cause hazardous conditions for the operation of motor vehicles and aircraft.

Particulate pollutants enter the human body by way of the respiratory system; and, therefore, their most immediate effects are upon this system. The size of the particle determines the depth of penetration into the respiratory system. Particles over 5 microns are generally stopped and deposited mainly in the nose and throat. Those that do penetrate deeper in the respiratory system to the air ducts (bronchi) are soon removed by ciliary action. Particles ranging in size from 0.5 - 5.0 microns in diameter can be deposited in the bronchi, with

few reaching the air sacks (alveoli). Most particles deposited in the bronchioles are removed by the cilia within two hours. Particles less than 0.5 micron in diameter reach and may settle in the alveoli. The removal of particles from the alveoli is much less rapid and complete than from the larger passages. Some of the particles retained in the alveoli are absorbed into the blood.

High particulate concentrations have been associated with increased mortality and bronchitis. Long term effects due to the chemical nature of the deposited particulates may be increased incidence of cancer and heart attack. In some instances particles, which by themselves may not have a great effect on health, can absorb toxic gases, reach the alveoli and release the toxic substance into the blood.

Plant surfaces and growth rates may be adversely affected by particulate matter. Particulate air pollution also causes a wide range of damage to materials, and includes corrosion of metals and electrical equipment, and the soiling of textiles and buildings.

Particles which cause the most health and visibility difficulties are those less than 1.0 microns in size. These particles are also the most difficult to reduce in numbers by the various industrial removal techniques. Rainfall-washout accounts for the major removal of these particles.

2.2 SULFUR DIOXIDE

Sulfur dioxide is an atmospheric pollutant which results from combustion processes (mainly burning of fossil fuels containing sulfur compounds), refining of petroleum, manufacture of sulfuric acid, and smelting of ores containing sulfur. Reduction of sulfur dioxide pollution levels can generally be achieved through the use of low sulfur content fuels or the use of chemical sulfur removal systems.

Once in the atmosphere some sulfur dioxide can be oxidized (either photochemically or in the presence of a catalyst) to SO₃ (sulfur trioxide). With water vapor present, SO₃ is readily converted to sulfuric acid mist. Other basic oxides combine with SO₃ to form sulfate aerosols. Sulfuric acid droplets and other sulfates are thought to account for about five to 20 percent of the total suspended particulate matter in urban air.

The effects of the oxides of sulfur on health are related to the irritation of the respiratory system with such injury resulting in temporary or permanent damage.

The enhancement by particulate matter of toxic response to sulfur dioxide (synergism) has been observed under conditions which would promote the conversion of sulfur dioxide to sulfuric acid. The degree of enhancement is related to the concentration of particulate

matter. A threefold to fourfold increase of the irritant response to sulfur dioxide is observed in the presence of particulate matter capable of oxidizing sulfur dioxide to sulfuric acid. There are probably few communities where individuals with impaired health are not susceptible to the adverse effects of elevated levels of sulfur oxides and particulate matter.

Sulfur dioxide can cause acute or chronic leaf injury to plants. Acute injury, produced by high concentrations for relatively short periods, usually results in the injured tissue changing to an ivory color. Chronic injury, which results from lower concentrations over a number of days or weeks, leads to pigmentation of leaf tissue, a gradual yellowing (chlorosis) in which the chlorophyll-making mechanism is impeded. Both acute and chronic injury may be accompanied by the suppression of growth and yield.

Corrosion rates are higher in urban and industrial atmospheres, with relatively high levels of both particulate and sulfur oxides, than they are in rural areas. Sulfur oxides pollution contributes to the damage of electrical equipment of all kinds. Building materials and textile fibers are also harmed by atmospheric sulfur oxides.

2.3 CARBON MONOXIDE

The major source of carbon monoxide (CO), by far, is the motor vehicle. The U.S. EPA has kept under its jurisdiction the regulation of emission control equipment on new motor vehicles, while the State's primary responsibility for reducing excessive ambient carbon monoxide levels is limited to the development of transportation plans for congested urban areas.

The toxic effect of high concentrations of CO (greater than 100 ppm) on the body is well known. Carbon moxoxide is absorbed by the lungs and reacts with the hemoglobin of the blood. The absorption of CO is associated with a reduction in the oxygen-carrying capacity of blood. The affinity of hemoglobin for CO is over 200 times that for oxygen, indicating that carboxyhemoglobin (COHb) is a more stable compound than oxyhemoglobin. The higher the percentage of hemoglobin bound up in the form of carboxyhemoglobin, the more serious is the effect.

The level of COHb in the blood is directly related to the CO concentration of the inhaled air. For a given ambient air CO concentration, the COHb level in the blood will reach an equilibrium concentration after a sufficient time period. This equilibrium COHb level will be maintained in the blood as long as the ambient air CO level remains unchanged. However, the COHb level will slowly change in the same direction as the CO concentration of the ambient air as a new equilibrium is established. In this way low level CO poisoning is reversible.

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An exposure of eight or more hours to CO concentrations of 10 to 15 ppm has been associated with adverse health effects as manifested by impaired time-interval discrimination, while levels greater than 30 ppm (episode level) can cause problems for individuals with heart disease.

Studies on the existing ambient levels of CO do not indicate any adverse effects on vegetation, materials, or other aspects of human welfare.

2.4 NITROGEN DIOXIDE

Nitrogen gas (N2) is an abundant and inert gas which makes up almost 80 percent of the earth's atmosphere. In this form, it is harmless to man and essential to plant metabolism. Due to its abundance in the air, it is a frequent reactant in many combustion processes. When combustion temperatures are extremely high, as in the burning of coal, oil, gas, and in automobiles engines, atmospheric nitrogen (N_2) may combine with oxygen (0_2) to form various oxides, NO_x. Of these, nitric oxide (NO) and nitrogen dioxide (NO₂) are the most important contributors to air pollution; NO_x generally is used to represent these. Nitric oxide (NO) is a colorless and odorless gas. It is the primary form of NO_X resulting from the combustion process. NO_X contributes to haze and a reduction of visibility. NO_x is also known to cause deterioration and fading of certain fabrics. Depending on concentration and extent of exposure, plants may suffer leaf crop lesions, and reduced crop yield. NO itself is not considered harmful to humans at concentrations found in the atmosphere, but NO2 has been shown to cause inflammation in the lungs and bronchi in ranges from .062 to .109 ppm for a 24-hour mean concentration.

The ambient air quality standard for NO_2 is 100 microgram per cubic meter (0.05 parts per million ppm) for an annual average. Until recently, reliable methods for continuously measuring ambient NO_X levels were not available and, therefore, less information is available than for the oxides of sulfur and other pollutants. Even now, different sampling techniques may yield different results; hence the methodology to be used must be chosen carefully in accordance with the purpose of the sampling.

 NO_X may also react with water to form corrosive acids, although this is not considered a serious pollution problem; NO_X and various other pollutants (e.g., hydrocarbons) may react in the presence of sunlight to produce photochemical oxidants. These are extremely unstable compounds which damage plants and irritate both the eyes and respiratory system of people. Ozone (O_3) and a group of chemicals called peroxyacetyl nitrates (PAN) are the major constituents of photochemical oxidants.

Methods to control NO_X emissions include the lowering of combustion temperatures and decreasing available oxygen needed for combustion.

2.5 HYDROCARBONS

Studies conducted thus far on the effects of ambient air concentrations of gaseous hydrocarbons have not demonstrated direct adverse effects on human health. But, it has been demonstrated that ambient levels of photochemical oxidant, which do have adverse effects on health, are directly related to gaseous hydrocarbon concentrations; thus, an air quality standard exists for hydrocarbons in order to take into account their contribution to the formation of hazardous photochemical oxidant. The standard is written as a 6-9 a.m. average since hydrocarbons emitted during that period are likely to be involved in the photochemical process.

2.6 PHOTOCHEMICAL OXIDANTS

Photochemical oxidants result from a complex series of atmospheric reactions initiated by sunlight. When reactive hydrocarbons and nitrogen oxides accumulate in the atmosphere and are exposed to the ultraviolet component of sunlight, the formation of new compounds, including ozone and peroxyacetyl nitrates, takes place.

Absorption of ultraviolet light energy by nitrogen dioxide results in its dissociation into nitric oxide and an oxygen atom. The oxygen atoms for the most part react with atmospheric oxygen to form ozone. A small portion of the oxygen atoms and ozone react also with certain hydrocarbons to form free radical intermediates and various products. In some complex manner, the free radical intermediates and ozone react with nitric oxide. A result of these reactions is a very rapid oxidation of the nitric oxide to nitrogen dioxide and an increased concentration of ozone.

Ozone can also be formed naturally in the atmosphere by electrical discharge, and in the stratosphere by solar radiation; both processes are not capable of producing significant urban concentrations of this pollutant.

Injury to vegetation is one of the earliest manifestations of photochemical air pollution, and sensitive plants are useful biological indicators of this type of pollution. The visible symptoms of photochemical oxidant produced injury to plants may be classified as: (1) acute injury, identified by cell collapse with subsequent development of necrotic patterns; (2) chronic injury, identified by necrotic patterns or with other pigmented patterns; and (3) physiological effects, identified by growth alterations, reduced yields, and changes in the quality of plant products. The acute symptoms are generally characteristic of a specific pollutant; though highly characteristic, chronic injury patterns are not. Ozone injury

to leaves is identified as a stippling or flecking. Adverse effects on sensitive vegetation have been observed from exposure to photochemical oxidant concentrations of about $100~\text{ug/m}^3$ (0.05 ppm) for 4 hours.

Adverse effects on materials (rubber products and fabrics) from exposure to photochemical oxidants have not been precisely quantified, but have been observed at the levels presently occurring in many urban atmospheres.

Adverse health effects, as shown by impairment of performance of student athletes, have occurred over a range of hourly average oxidant concentrations from 60 to 590 ug/m 3 (0.03 to 0.3 ppm). Adverse health effects, as manifested by eye irritation, have been reported when photochemical oxidant concentrations reached instantaneous levels of about 200 ug/m 3 (0.10 ppm), a level that could be related to an hourly average concentration ranging from 60 to 100 ug/m 3 (0.03 to 0.05 ppm).

3.0 AIR SAMPLING NETWORK

3.1 DESCRIPTION OF NETWORK

The Illinois Air Monitoring Network is composed of equipment operated by both the Illinois Environmental Protection Agency and by cooperating local agencies. This network has been designed to measure ambient air quality levels in the various Illinois Air Quality Control Regions (AQCR). These Air Quality Control Regions were developed with consideration given to jurisdictional boundaries, urban-industrial centers, and atmospheric conditions. These factors, when evaluated concurrently, resulted in the designation of an area adequate for the assessment of air quality and the implementation of air quality control measures. Historically, each region was classified on the basis of known air pollutant concentrations or, where these were not known, estimated air quality. A map of the AQCR's in Illinois can be found on the inside front cover.

The present Illinois Environmental Protection Agency Air Monitoring Network is deployed along the lines detailed in the Illinois State Implementation Plan. The Air Monitoring Network encompasses the entire State; however, major concentrations of monitors are found in Region 67 (Metropolitan Chicago) and Region 70 (Metropolitan East St. Louis).

The original emphasis in the design and operation of the Illinois monitoring network was toward meeting the minimum instrument requirements based on the Air Quality Control Region priority classification. An effort was made to locate instruments at sites which would be representative of air quality in the area. For reasons of ease of access and maintenance, several air monitoring instruments were often located at the same site. Because of this, the prime location which might be chosen to monitor sulfur dioxide from fuel combustion sources might be less appropriate for the monitoring of carbon monoxide and vice versa. Recent emphasis has been placed on locating individual monitoring instruments at sites which are likely to represent ambient air quality due to the sources which are primary contributors of the pollutant being measured. The air quality data contained in this report should be viewed with the understanding that the location of the monitoring instrument may preclude obtaining the maximum concentration in all situations.

The Illinois Air Monitoring Network is operated with the cooperation and support of various agencies and local volunteers. Table 3 contains a summary by Air Quality Control Region of the distribution of air monitoring instruments which contribute to the Illinois Ambient Air Monitoring Data Bank. The Illinois Air Monitoring Network contains both continuous and non-continuous instruments. The continuous instruments operate continually throughout the year, while the non-continuous monitoring instruments operate according to the schedule shown in Table 4. This is the official sampling schedule used by the Illinois EPA during 1977.

The present network utilizes instrumentation which is a great deal more sophisticated than was envisioned in the initial State Implementation Plan (1972). More emphasis is presently placed upon the quality assurance, calibration and maintenance aspects of these instruments. It is important to note that most network sensors are measuring pollution concentrations in the parts per billion range; that is, one part of pollutant per billion parts of ambient air, and a significant technical effort must be expended to insure accurate measurement at these levels.

DISTRIBUTION OF AIR MONITORING INSTRUMENTS
BY AIR QUALITY CONTROL REGION

			-				,		بطائدين		يتسنعه	<u></u>
	65	66	- 67	68	69	70	71	n	73	74	75	Total
Number of Samplers												
H1-Volume Sampler	8	z	92	1	,	16	•	,	,	4	,	149
AISI Tape Sampler	Ž.		19	1	١	•	3		1	1	3	33
Sulfur Dioxide (Continuous)	5		19	,	1	5	1		1	1	3	36
Hitrogen Bioxi <i>del</i> Hitrogen Oxide (Continuous)	2		4			1					1	8
Ozone	1		17		1	4	1		1	1	3	29
Sulfur/Mitrogen Digzide (Bubbler)	6	3	45	1	1	3	3	1	1	3	3	70
Sulfur Dioxide (Bubbler)			2									2
Carpon Monoxide	1		15	:	1	z					-	27
Hydrocarbons			4								t	5
Jind Sýstens	1		13		1	5	1		1	1	3	26
Total	26	5	230	3	15	40	13	2	9	=	27	373

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Table 4

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1977 AIR SAMPLING SCHEDULE

1st Quarter	2nd Quarter
Jan. 1 Sat. Jan. 7 Fri. Jan. 13 Thur. Jan. 19 Wed. Jan. 25 Tues.* Jan. 31 Mon. Feb. 6 Sun. Feb. 12 Sat. Feb. 18 Fri. Feb. 24 Thur. Mar. 2 Wed. Mar. 8 Tues.* Mar. 14 Mon. Mar. 20 Sun. Mar. 26 Sat.	Apr. 1 Fri. Apr. 7 Thur. Apr. 13 Wed. Apr. 19 Tues.* Apr. 25 Mon. May 1 Sun. May 7 Sat. May 13 Fri. May 19 Thur. May 25 Wed. May 31 Tues. June 6 Mon.* June 12 Sun. June 18 Sat. June 24 Fri. June 30 Thur.
3rd Quarter	4th Quarter
July 6 Wed. July 12 Tues. July 18 Mon.* July 24 Sun. July 30 Sat. Aug. 5 Fri. Aug. 11 Thur. Aug. 17 Wed. Aug. 23 Tues. Aug. 29 Mon. Sept. 4 Sun.* Sept. 10 Sat. Sept. 16 Fri. Sept. 22 Thur. Sept. 28 Wed.	Oct. 4 Tues. Oct. 10 Mon. Oct. 16 Sun. Oct. 22 Sat.* Oct. 28 Fri. Nov. 3 Thur. Nov. 9 Wed. Nov. 15 Tues. Nov. 21 Mon. Nov. 27 Sun. Dec. 3 Sat.* Dec. 9 Fri. Dec. 15 Thur. Dec. 21 Wed. Dec. 27 Tues.

^{*} Special hi-vol metal analysis sampling date.

Spectral grade filters will be sent to all operators prior to this date with detailed instructions for use.

3.2a DIRECTORY OF AIR QUALITY MONITORING SITES OPERATED DURING 1977

Following is a directory showing the air monitoring sites operated by the Illinois EPA as well as the various cooperating agencies. This directory does not include special purpose monitoring sites or sites operated by private concerns. An explanation of the terms and equipment codes symbols is provided at the end of the directory.

STATION	ADDRESS	OWNER/ OPERATOR	UTM COORD.	SAMPLING HEIGHT (FEET)	EQUIPMENT
65 BURLINGTON-KEOKUK IN	TERSTATE (ILL IND.)				
6a1 esburg (2740 001)	Library Main Street	Ill. EPA/City	N. 4143254 E. 714695	ŻŠ	TŞP
Galesburg (2740 003)	161 South Cherry	III. EPA/Cfty	N. 4143174 E. 714633	30	SO2/NO2 (Bubbler)
PEORIA COUNTY					
Peoria (6080 001)	610 N. E. Jéffé rs ön	III. EPA/Peoria Inspections Dept.	N. 4508172 E. 281481	20	TSP
Peoria (RASN) (Disc.) (6080 001)	610 N. E. Jefferson	U.S. EPA/Peoria Inspections Dept.	N. 4508172 E. 281481	20	TSP, SO2/NO2 (Bubbler)
Peoria (6080 023)	Firestation #4 2711 S. W. Jefferson	Ill. EPA/Peoria Inspections Dept.	N. 4505814 E. 278611	24	TSP. SO2/NO2 (Bubbler)
Peoria (6080 024)	Firestation #8 MacArthur and Hurlburt	III. EPA	N. 4507234 E. 279425	24	SO2 (Continuous), O3 Telemetry
Peoria (6080 027)	Maintenance Building 1604 Detweiller	Ill. ÉPA/Peoria Inspections Dept.	N. 4518407 E. 279012	20	TSP, SO ₂ /NO ₂ (Bubbler)
Peoria (6080 028)	Olin Hall Bradley University	Ill. EPA/Bradley University	N. 4508314 E. 278796	35	TSP
Peoria (6080 029)	Salvation Army 407 N. E. Adams	111. EPA	N. 4507925 E. 281401	30	SO ₂ (Continuous), NO/NO ₂ (Continuous), CO, COH, WS/WD, Telemetry
Peoria (6080 030)	City Hall 419 Fulton	Ill. EPA/Peoria Inspections Dept.	N. 450772 <u>B</u> E. 280753	65	SO2/NO2 (Bubbler),
Peoria (New) (6080 031)	Administration Building Glen Oak Park Pavillion	III. EPA	N. 4509888 E. 282808	15	SO2 (Continuous)
TAZEWELL COUNTY					
	Lincoln School 801 Springfield Road	11], EPA	N. 4503604 E. 282679	15	SO2 (Continuous)
East Peoria (New) (2100 001) East Peoria (2100 002) East Peoria (2100 003)	East Peoria Bank 235 East Washington	Ill. EPA/Peoria Inspections Dept.	N. 4505074 E. 281061	12	TSP
East Peorla (2100 003)	Illini Brick 1167 West Washington	ill. EPA/Peorla Inspections Dept.	N. 4506555 E. 281080	15	SO2/MO2 (Bübbler)
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STATION	ADDRESS	ÖWNER/ OPERATOR	UTM COORD.	SAMPLING HEIGHT (FEET)	EQUIPMENT
Pekin (6060 002)	531 Court	Ill. EPA/Cilco	M. 4494067 E. 276117	. 20	TŠP .
Pekiñ (6050 004)	Firestation #3 272 Derby	IÏĪ. EPA	N. 4492740 E. 275283	15	SO2 (Continuõus), COH Telemetry
66 EAST CENTRAL ILLINOI	S INTRASTATE				
CHAMPAIGN COUNTY					
Champaign (1140 002)	Regional Office Building 2125 South First Street	Ill. EPA	N. 4437728 E. 394197	20	TSP, SO ₂ /NO ₂ (Bubbler)
MC LEAN COUNTY					103
Bloomington (0480 001)	Pantograph Building 301 West Washington	Ill. EPA/Daily Pantograph	N. 4483116 E. 330116	27	TSP, SO ₂ /NO ₂ (Bubbler)
		·			
VERMILION_COUNTY Danville	Vermillon Co. Court House	III. EPA/Mr.	N. 4441641	. 65	SO ₂ /NO ₂ (Bubbler)
(1720 002)	4 North Vermilion	Bracewell	E. 446388	. 65	SIZ/NOZ (BUBUTEF)
1	INTERSTATE (ILL IND.)				
COOK COUNTY Arlington Heights	33 S. Arlington Heights Rd.	Cook County DEC	N. 4659111	32	TSP
(0200 001) Bedford Park	, , , , , , , , , , , , , , , , , , , ,	Bedford Park	E. 418716		
(1540 002)	6535 South Central		N. 4624549 E. 436827	30	TSP, SO2 (Bubbler) SO2 (Continuous), 03, COH
Bedford Park (1540 015)	Community Park 6700 South 78th Avenue	Bedford Park Env. Quality Control Board	N. 4624333 E. 432228	30	TSP, SO ₂ (Bubbler), COH
Blue Island (0500 001)	Eisenhower High School 12700 Sacramento	Cook County DEC	N. 4612262 E. 442932	43	TSP, SO ₂ /NO ₂ (Bubbler)
Blue Island (RASN) (Disc.) (0500 001)	ÉÍsenhower High Schóól 12700 Sacramento	ÚSEPA/Čook County DEC	N. 4612262 E. 442932	43	SO ₂ /NO ₂ (Bubbler)
Calumet City (0780 001) Chicago Heights (Disc.) (1240 003) Chicago Heights (1240 001)	Thorton Fractional HS 755 Pulaski Road	Cook County DEC	N. 4605938 E. 454802	26	TSP, SO ₂ /NO ₂ (Bubbler) SO ₂ (Continuous), CO, O ₃ , COH, MS/WD, Telemetry
Chicago Heights (Disc.) (1240 003)	450 State Street	Ill. EPA/Da <u>we</u> s Labs.	N. 4596617 E. 447327	25	TSP
	Bloom High School Dixie Highway & 10th Street	Cook County DEC	N. 4595888 E. 446172	33	TSP, SO ₂ /NO ₂ (Bubbler) SO ₂ (Continuous), CO, O3, COH, WS/WD, Telemetry
Cicero (1340 001) Des Plaines (1840 001)	Roosevelt High School 15th Street & 50th Avenue	Cook County DEC	N. 4634425 E. 437598	34	TSP, SO2/NO2 (Bubbler)
Des Plaines (1840 001)	Maine West High School 1755 South Wolf Road	Cook County DEC	N. 4652290 E. 424858	.32	TSP, SO ₂ /NO ₂ (Bubbler)
	· 297				

STATION	ADDRESS	OWNER/ OPERATOR	UTM COORD.	SAMPLING HEIGHT (FEET)	EQUIPMENT
Evanston (2360 001)	Police Department 1454 Elmwood		N. 4654734 E. 443240	25	TSP
Flossmoor (2520 001)	Community High School 999 Kedzie Avenue		N. 4599302 E. 442080	33	TSP, SO ₂ /NO ₂ (Bubbler)
Franklin Park (2620 001)	E. Leyden High School 3400 North Rose Street		N. 4643567 E. 427981	31	TSP
Glenview (2940 001)	Village Hall 1930 Prairie Street	Ill. EPA/City	N. 4658148 E. 433327	25	TSP
Harvey (3180 001)	Lowell School 157th and Lexington		N. 4605962 E. 445895	26	TSP, SO ₂ /NO ₂ (Bubblér)
Hillside (3420 001)	Proviso West High School Wolf Road & Harrison Street	Cook County DEC	N. 4635283 E. 425327	33	TSP, SO ₂ /NO ₂ (Bubbler), SO ₂ (Continuous), CO, O ₃ , COH, MS/MD, Telemetry
McCook (1540 016)	Village Hall 50th Street and Glencoe	McCook Env. Board	N. 4627820 E. 430808	25	TŚP, ŚO ₂ (Continuous), COH, WS/WD
McCook (1540 017)	Route 66 and Lammdale	McCook Env. Board	N. 4627956 E. 431407	40	ŢSP
Midlothian (5080 001)	Breman High School 15202 Crawford Avenue		N. 4607135 E. 440339	29	TSP
Morton Grove (5320 001)	Fireside Motel 9111 Waukegan		N. 4655197 E. 433944	30	TSP, SO ₂ /NO ₂ (Bubbler)
Niles (5540 001)	Gemini High School 8955 Greenwood Avenue		M. 4654611 E. 430623	24	TSP
Oak Park (5740 002)	834 Lake St ree t		N. 4637456 E. 433771	31	TSÞ, ŚŊ _Ź /NNġ (Búbbler)
Orland Park (5860 001) :	Carl Sandburg High School 133rd and LaGrange Road	Cook County DEC	N. 4610925 E. 428641	23	TSP
Palatine (5900 001)	Township High School 1000 Quentin Road		N. 4660703 E. 408549	27	TSP
Park Forest (6000 001)	Water Filtration Plant 100 Park Avenue		N. 4593697 E. 443283	30	TŚP, SO ₂ /NO ₂ (Bübbler)
River Forest (6540 001)	Junior High School Lathrop and Oak Avenues	Cook County DEC	N. 4637969 E. 432456	31	TSP
Skok1e (7160 005)	Miles N. High School 9800 Lawler	Cook County DEC	N. 4656493 E. 437740	41	SO ₂ /MO ₂ (Bubbler), SO ₂ (Continuous), CO, O ₃ , COH, WS/MD, Telemetry
Skokfe (7160 005)	Golf Course 4401 Demoster		N. 4654197 E. 438876	ŻÓ	TŠP
Skäkfe (7160 007)	Niles East High School 7701 Lincoln Avenue	III. EPA/City Health Dept.	N. 4652296 E. 437827	30	TSP
Summit (7520 001)	Graves School 60th and 74th Avenue	Cook County DEC	N. 4625734 E. 433104	23	TSP, SO ₂ /NO ₂ (Bubbler)
Wilmette (8360 001)	Central School 9th Street & Central Ave.	Cook County DEC	N. 4658469 E. 441870	30	TSP, SO ₂ /NO ₂ (Bubbler)
River Forest (6540 001) Skokie (7160 005) Skokie (7160 006) Skokie (7160 007) Summit (7520 001) Wilmette (8360 001)	Crow Island School 112 Willow Road	Ill. EPA/Evanston North Shore H.D.		30	TSP

2-12-7					
STATION	ADDRESS	OWNER/ OPERATOR	UTM COORD.	SAMPLING HEIGHT (FEET)	EQUIPMENT
Chicago:					
Addams Elementary School (1220 031)	10810 South Avenue "H"	Chicago DEC	M. 4616172 E. 455765	32	TSP, \$0 ₂ /NO ₂ (Bubbler)
Anthony Elementary School (1220 030)	9800 South Torrence Ave.	Chicago DEC	N. 4618246 E. 453462	16	TSP, SO ₂ /MO ₂ (Bubbler)
Austin West High School (1220 036)	118 North Central	Chicago DEC	M. 4637061 E. 436746	14	TSP, SO ₂ /NO ₂ (Bubbler), SO ₂ (Cont.), Tele., CO, O ₃
Calumet High School (1220 016)	8131 South May Street	Ch1cago DEC	N. 4621623 E. 445907	48	TSP, 50 ₂ /NO ₂ (Bubbler)
Anthony Elementary School (1220 030) Austin West High School (1220 036) Calumet High School (1220 016) CAMP (1220 002)	445 Plymouth Court	USEPA/Chicago DEC	N. 4636074 E. 447765	10	TSP, SO ₂ /NO ₂ (Bubbler), SO ₂ (Continuous), NO/NO ₂ (Continuous), CO, O ₃ , THC, CH4, COH,
Carver High School (1220 018)	801 East 133rd Place	Chicago DÉC	N. 4611172 E. 449833	49	TSP, 50 ₂ /NO ₂ (Bubbler)
Cérmak Pump Station (1220 026)	735 West Harrison	Chicago DEC	N. 4635851 E. 446543	26	SO ₂ (Continuous), CO, O ₃ , COH, WS/WD, Telemetry
Chicago City Central Office Building (RASN) (1220 001)	320 North Clark	USEPA/Chicago DEC	N. 4637475 E. 447734	105	TSP, 50 ₂ /MO ₂ (Bubbler)
Chicago Vocatio <u>nal H.S.</u> (1220 017)	2100 East 87th Street	Chicago DEC	N. 4620648 E. 452351	55	TSP, SO ₂ /NO ₂ (Bubbler)
Clay Elementary School (1220 019) (DISC)	13231 South Burley Avenue	Chicago DEC	N. 4611358 E. 454617	57	TSP. 50 ₂ /NO ₂ (Bubbler)
Cooley Vocational H.S. (1220 012)	1225 North Segwick	Chicagó DEC	N. 4639141 E. 447148	51	TSP, SN ₂ /NO ₂ (Bubbler)
Crib (1220 034)	68th St. Lake Michigan	Chicago DEC	N. 4626006 E. 456037	50	TSP, SO ₂ /NO ₂ (Bubbler)
Daley Center (1220 035)	Washington and Clark	Chicago DEC	N. 4636858 E. 447808	7	со. Тн¢, сн₄
Edgewater (1220 037)	5358 North Ashland Avenue	Chicago DEC	N. 4647469 E. 444580	23	TSP, \$0 ₂ /NO ₂ (Bubbler) \$0 ₂ (Continuous), CO, O ₃ , COH, Telemetry
Farr Dormitory (DISC) (1220 014)	3300 South Michigan Avenue	Chicago DEC	N. 4631364 E. 448179	40	TŞP
Fenger Juntor College (1220 010)	11220 South Wallace	Chi <u>ca</u> go DEC	N. 4615296 E. 447098	48	TSP, SO ₂ /KO ₂ (Bubbler) SO ₂ (Continuous), CO, G ₃ , COH, Telemetry
G.S.A. Building (1220 005)	538 South Clark	Chicago DÉC	N. 4636074 E. 447763	133	TSP, SO ₂ /NO ₂ (Bubbler)
Hale Elementary School (1220 021)	6140 South Melvina Avenue	Chicago DEC	N. 4625450 E. 435469	31	TSP. SO ₂ /NO ₂ (Bubbler)
Kelly High School (1220 015)	4136 South California Ave.	Chicago DEC	M. 4629666 E. 442129	48	TSP, SO ₂ /NO ₂ (Bubbler)
Kenwood High School (1220 025)	5015 Blackstone	Chtcago DEC	N. 4628086 E. 450808	53	TSP, SO ₂ /NO ₂ (Bubbler) TSP, SO ₂ /NO ₂ (Bubbler) TSP, SO ₂ /NO ₂ (Bubbler) TSP, SO ₂ /NO ₂ (Bubbler), SO ₂ (Continuous), O ₃ , COR, WS/MD, Telemetry TSP, SO ₂ /NO ₂ (Bubbler)
Lakeview High School (1220 004)	4015 North Ashland Äve.	Chicago DEC	N. 4644882 E. 444537	64	TSP, SO ₂ /NO ₂ (Bubbler)
	v	<u> </u>		J	

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,这是一个人,我们就是一个人,我们就是一个人,我们就是一个人,我们就是一个人,我们就是一个人,我们也是一个人,我们也是一个人,我们也会会会会会会会会会会会会会会

ŜTATION	ADDRESS	OWNER/ OPERATOR	UTM COORD.	SAMPLING HEIGHT (FEET)	EQUIPMENT
Lindblom High School (1220 007)	6130 South Wolcott Ave.	Chicago DEC	N. 4625623 E. 444086	51	TSP, SO ₂ /NO ₂ (Bubbler), SO ₂ (Continuous), O ₃ , COM, WS/MD, Telemetry
Logan Sq. (III. Bell) (1120 028)	2940 West Cortland Ave.	Chicago DEC	N. 4640438 E. 441962	63	TSP
Medical Center (1220 033)	1947 West Polk	IJI. EPA	N. 4635530 E. 444567	15	TSP, SO ₂ (Continuous), NO/NO ₂ (Continuous), CO, O ₃ , RHC, COH, WS/MD, Meteor., Telemetry
South Water Filt. Plant (1220 032)	3300 East Cheltenham Place	Chicago DEC	N. 4622722 E. 454709	30	TSP, SO ₂ /RO ₂ (Bubbler)
State Office Building (1220 040) (NEW)	160 North LaSalle	Ill. EPA	N. 4636950 E. 447500	11	\$02 (Continuous), NO/NO2 (Continuous), CO, O3, Telemetry
Steinmetz High School (1220 011)	3030 North Mobile Avenue	Chicago DEC	N. 4642679 E. 435148	73	TSP, SO ₂ /NO ₂ (Bubbler)
Stevenson Ele. School (1220 009)	8010 South Kostner Avenue	Chicago DEC	N. 4621759 E. 439135	ři	TSP, SO2/NO2 (Bubbler), SO2 (Continuous), CO, O3: COH, WS/WD, Telemetry
Sullivan High School (1220 020)	6631 North Bosworth Avenue	Chtcago DEC	N. 4650074 E. 444543	55	TSP, \$0 ₂ /NO ₂ (Bubbler)
Sunnyside and Knox (1220 027)	4632 West Sunnyside	Chicago DEC	N. 4645962 E. 438228	6	cń .
Taft High School (1220 003)	5625 North Natoma Avenue	Chicago DEC	M. 4648111 E. 434438	55	TSP, SO ₂ /NO ₂ (Bubbler), SO ₂ (Continuous), O ₃ , COH, WS/WD, Telemetry
Von Steuben High School (1220 039)	5039 North Kimball Ave.	Chicago DEC	N. 4646950 E. 440790	81	TSP
Von Steuben High School (1220 039) Washington High School (1220 022) DUPAGE COUNTY	3500 East 114th Street	Chicago DÉC	N. 4615074 E. 455030	31	TSP. SO ₂ /HO ₂ (Bubbler)
DuPAGE COUNTY					
Addison (0060 001)	City Hall 130 W. Army Trail Road	III. EPA/DuPage Co. Health Dept.	N. 4642549 E. 417543	40	TSP
Bensenville (0380 001)	N. Fire Station Main and York Road	Ill. EPA/City	N. 4645234 E. 422222	20	TSP
Bensenville (0380 002)	Beeline Fashions 375 Meyer	ill. EPA/City	N. 4646345 E. 422055	20	TSP, SO ₂ /MO ₂ (Bubbler)
Elmhurst (2300 001)	Police Station 188 Schiller	Ill. EPA/DuPage Co. Health Dept.	N. 4639049 E. 422123	25	TŞP
Naperville (5480 001)	Fire Station 175 Jackson Street	Ill. EPA/DuPage Co. Health Dept.	N. 4624938 E. 404376	25	TSP
West Chicago (8080 001)	DuPage County Airport	Ill. EPA/DuPage Co. Health Dept.	N. 4640808 E. 397063		TSP
West Chicago (8080 002)	Police Station 128 West McConnell Street	Ill. EPA/DuPage Co. Health Dept.	N. 4637626 E. 400080		TSP
Bensenville (0380 001) Bensenville (0380 002) Elmhurst (2300 001) Naperville (5480 001) West Chicago (8080 001) West Chicago (8080 002) Wheaton (8220 002)	Court House 201 Réber Street	Ill. EPA/DuPage Co. Health Dept.	N. 4635049 E. 408358		TSP

STATION	ADDRESS	OWNER/ OPERATOR	UTM GOORD.	SAMPLING HEIGHT (FEET)	EQUIPMENT
KANE COUNTY Elgin (2260 001)	Modern Dairy 1002 North Liberty	Ill. ÉPA/City	N. 4656672 E. 395018	25	TSP
KANKAKEE COUNTY Bradley (0580 001)	E. Elementary School 610 East Liberty Street	III. EPA	N. 4554462 E. 428259	12	TSP
KENDALL COUNTY Plano (6280 001)	City Hall Main Street	ΪΊΙο ΈΡΑ/Mrs. Aterburn	N. 4611500 E. 372500	25	TSP .
<u>LAKE COUNTY</u> Island Lake (4000 001)	Island Laké Grade School	III. EPA/Lake Co. Health Dept.	N. 4680666 E. 401416	15	TSP .
Lake Bluff (4020 001) North Chicago (RASN) (5620 002)	E. Elementary School 121 East Sheridan Place 1850 Lewis Avenue	Ill. EPA/Lake Co. Health Dept. U.S. EPA/Lake Co. Health Dept.	E. 430166		TSP TSP
Waukegan (8020 001)	City Hall 106 Utica	Ill. EPA/Lake Co. Health Dept.	N. 4690283 E. 430950		TSP SD: (forestowns)
Waukegan (8020 002) Waukegan (8020 003)	N. Fire Station Golf and Jackson W. High School 2200 Brookside	Ill. EPA/L.C.H.D. (H1-Vol),Ill.EPA Lake County Health Dept.	N. 4690700 E. 428450		TSP, SN ₂ (Continuous)
Waukegan (8020 004) McHENRY COUNTY	County Health Department 3010 Grand Avenue	Ill. EPA/Läke Co. Health Dept.	N. 4691500 E. 427283	15	SN ₂ /NO ₂ (Bubbler)
Cary (1020 001) Crystal Lake	Cary High School 1st St. & Three Oaks Road Franklin & Caroline St.	Ill. EPA/City High School Ill. EPA/City	N. 4674876 E. 397580 N. 4676876	20	TŜP
(1680 002) WILL COUNTY		and and and	E. 390722		
Crete (1640 001) Jolfet	Crete Grammar School North & Elizabeth Sts. Rialto Building	Will County Health Dept.	N. 4588265 E. 447635 N. 4597543	18 15	TSP
(3760 001) Joliet	5 East Van Buren Pershing School	Will County Health Dept. Will County	E. 409660 N. 4597641	16	TSP, SO ₂ /NO ₂ (Bübbler)
(3760 002) Joliet (3760 003)	Midland and Campbell Rivals Park 1425 North Broadway	Health Dept. Will County Health Dept.	E. 406864 N. 4600253 E. 409086	50	TŞP
Joliet. (3760-004)	Gompers School Copperfield and Bridgs	Will County Health Dept.	N. 4598833 E. 412790	16	TSP TSP, SO ₂ /NO ₂ (Bübbler) TSP
	·				

				SAMPLING	
STATION	ADDRESS	OWNER/ OPERATOR	COORD.	HEIGHT (FEET)	EQUIPMENT
Joliet (3760 005)	Joliet and Benton Sts.	I11. EPA	N. 4598000 E. 409456	20	TSP, SO ₂ (Continuous), NO/NO ₂ (Continuous), CO, O ₃ , RHC, COH, WS/WD, Meteor., Telemetry
Joliet (3760 006)	Joliet Junior College 1216 Houbolt Street	Will County Health Dept.	N. 4597456 E. 410320	31	TSP
Joliet (3760 007)	Will County Health Department Building 501 Ella Avenue	Wfll County Health Dept.	N. 4595172 E. 410814	21	TSP, MS/MD
Lockport (4380 002)	5th & Madison	Will County Health Dept.	N. 4604796 E. 412641	15	TSP, SO ₂ /NO ₂ (Bubbler)
Mokena (8320 006)	10940 Front Street	Will County Health Dept.	N. 4598129 E. 426141	14	TSP
Monee (8320 005)	432 East Main Street	Will County Health Dept.	N. 4585320 E. 438438	16	TSP
Plainfield (6270 001)	Indian Trail Junior High 1005 Eastern	Will County Health Dept.	N. 4607438 E. 400395	16	TSP
Rockdale (8320 004)	Well #2 Pumping <u>Statio</u> n	Will County Health Dept.	N. 4595370 E. 466870	16	TSP, SO ₂ /NO ₂ (Bubbler) COH
Romeoville (6760 001)	Naperville Road	Will County Health Dept.	N. 4612240 E. 409680	28	TSP, SO ₂ /NO ₂ (Bubbler), COH
Wilmington (DISC) (8380 002)	201 North Main	Will County Health Dept.	N. 4611500 E. 372500	14	TSP
Wilmington (8380 003)	South Joliët Street Wilmington High School	Will County Health Dept.	N. 4572808 E. 403481	15	TSP
68 METROPOLITAN DUBUQUE	INTERSTATE (ILL wis.	= IOWA)			
JO DAVIESS COUNTY					
Galena (2720 002)	Kräft Foods Commerce Plant 311 South Main Street	Ill. EPA/ Jo Daviess Co. Health Dept.	N. 469R882 E. 711611	25	TSP, ŚÓŻ/NÖŻ (Bubbler)
Galena (2720 001)	Jo Daviess County Health Department Building	Ill. EPA/ Jo Daviess Co. Health Dept.	N. 4698895 E. 711302	25	сон .
69 METROPOLITAN QUAD CITIES INTERSTATE (ILL MO.)					
ROCK ISLAND COUNTY					
East Moline (2080 001)	City Hall 915 16th Avenue	Ill. EPA/Ouad Cities Aréa Regional APC AG	N. 459893A E. 713543	15	TSP, SO ₂ /NO ₂ (Bubbler)
Milan (5100 001)	Elémentary School 125 West 2nd Avenue	Ill. EPA/Quad Cities Area	N. 4591604 E. 703240		TSP
Moline (RASN) (5120 001)	City Hall 619 16th Street	U.S. EPA/City Health Dept.	N. 4597549 F. 707530		TSP
Moline (5120 001)	City Hall 619 16th Street	III. EPA/City Health Dept.	N. 4597549 E. 707530	30	TSP
Moline (5120 002)	Molthé High School 3600 23rd Avēnuė	Ouad Cities Area Regional APC AG	N. 4595691 E. 709925	.35	TSP

STATION	ADDRESS	OWNER/ OPERATOR	UTM COORD.	SAMPLING HEIGHT (FEET)	EQUIPMENT
		OI EXAION		(7821)	EGOIPMENT .
Rock Island (RASN) (6700 001)	1528 3rd Avenue	U.S. EPA/Quad City Air Pollution	N. 4597950 E. 702179	45	ŤSP
Rock Island (DISC) (6700 002)	County Hall 1504 3rd Avenue	Ill. EPA	N. 4597919 E. 701975	35	SO ₂ (Continuous), CO, O ₃ , COH, WS/WD, Telemetry
Rock Island (6700 003)	High School 1400 25th Avenue	Nuad Cities Area Regional APC AG	N. 4595493 E. 702327	30	TSP
WHITESIDE COUNTY					
Rock Falls (6660 001)	Rock Falls High School 101 12th Avenue	Whiteside County H.D./III. EPA	N. 4629333 E. 274700	25	TSP
Sterling (7400 001)	Fire Station 110 West 5th Street	Ill. EPA/Sterling H.S.	N. 4629583 E. 275283	28	TSP .
70 METROPOLITAN ST. LOU	IS ÎNTERSTATE (ILL MO.	· ·			
MADISON COUNTY					
Alton (0160 004)	City Hall 103 East 3rd Street	III. ËPA	N. 4308216 E. 744166	32	TSP
Alton (DISC) (0160 005)	Lowell School 1616 Joesting	Ill. EPA	N. 4308265 E. 746388	50	TSP, S^2/NO2 (Bubbler), S^2 (Continuous), O3, C^H, WS/WD
Alton (NEW) (0160 006)	Horace Mann School 2708 Edwards St.	Ill. EPA	N. 4309512 E. 747407	40	TSP, SO ₂ (Continuous). O ₃ , WS/WD, Telemetry
Collinsville (1500 002)	EPA Office 115A West Main	Ill. EPA	N. 4284232 E. 239953	40	TSP
Edwardsville (2180 002)	Madison County Court House Main & Purcell	III. EPA	N. 4299944 E. 242938	50	TSP
Granite City (2960 006)	City Hall 2000 Edison Avenue	Ill. EPA/Granite City APC	N. 4287407 E. 747771	40	TSP, SO ₂ /NO ₂ (Bubbler)
Granite City (2960 007)	Fire Station #1 23rd and Madison	Granite City APC	N. 4287734 E. 748481	45	TSP
Granite City (2960 008)	Lake Schööl 3201 East 23rd	Granite City APC	N. 4287580 F. 750611	14	TŠP
Granite City (2960 009)	2001 East 20th	Granite City APC	N. 7286654 E. 748777	15	TSP
Granite City (2960 010)	15th and Madison	Granite City APC	N. 4286500 E. 747277		TSP
Granite City (2960 011)	Fire Station #2 Roosevelt and Rock Road	Granite City APC	N. 4288333 E. 746586	18	TSP
(2960 011) Granite City (2960 012)	Granite City APC Office 2301 Adams	Granite City APC	N. 4288240 E. 747895	35	SO ₂ (Continuous), CO ^d COH, WS/WD TSP CO TSP, SO ₂ /NO ₂ (Bubbler), SO ₂ (Continuous), CO, O ₃ ,
Granite City (2960 015)	Frohart School 2040 Johnson	Ill. EPA/Granite City	N. 4289753 E. 750611		TSP
Granite City (NEW) (2960 017)	2001 Edison	Granite City APC	H. 4287364 E. 747864		со
(2960 015) Granite City (NEW) (2960 017) Wood River (8520 007)	Water Treatment Plant 54 N. Walcott	III. EPA	N. 4305185 E. 751135	15	TSP, Sn ₂ /Nn ₂ (Bubbler), Sn ₂ (Continuous), Cn, n ₃ , COH, WS/WD, Telemetry

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STATION	ADDRESS	OWNER/ OPERATOR	UTM COORD.	SAMPLING HEIGHT (FEET)	EQUIPMENT
MONROE COUNTY	_		-		
Columbia (1520 001)	City Hall 208 South Rapp	IÏI. EPA	N. 4258345 E. 744376	स्त	TSP
ST. CLAIR COUNTY				·	
Belleville (0320 001)	City Hall 101 South Illinois	III. EPA	N. 4266734 E. 329790	30	TSP
Cahokia State Park (2120 009)	Business Route 40	Ī11. ĖPA	N. 4282858 E. 754623	15	TSP, SO ₂ (Continuous), NO/MO ₂ (Continuous), CO, O ₃ , COH, WS/WD, Meteori, Telemetry
East St. Louis (2120 002)	City Hall 7 Collinsville Avenue	III. EPA/City	N. 4279043 E. 747277	50	TSP
East St. Louis (2120 008)	Federal Building 650 Missouri	III. EPA	N. 4278783 E. 747543	60	SN ₂ /NN ₂ (Bubbler), SN ₂ (Continuous), O ₃ ,
71 NORTH CENTRAL ILLING	IS INTRASTATE				COH, WS/WD, Telemetry
BUREAU COUNTY					
DePué (0680 001)	Spayer Residence 1401 Marquette	ill. ĒPA/Mr. Spayer	N. 4577512 E. 307938	6.5	TSP
Lasalle County		:			
LaSalle (4080 001)	LaSalle-Peru High School 541 Chartres	III. EPA	N. 4577611 E. 323469	ΑŌ	SO ₂ /NO ₂ (Bubbler), SO2 (Continuous), O3, COH, WS/WD, Telemetry
Oglesby (5800 001)	Rundle Residence 217 Portland	III. EPA/Mr. Rundle	N. 4573166 E. 327697	6.5	TSP
Ottawa (5880 002)	Ottawa Township High Sch. 211 East Main	Ill. EPA/Mr. Krabel	N. 4578475 E. 346296	50	TSP, \$0 ₂ /NO ₂ (Bubbler)
MARSHALL COUNTY					
Henry (3275 001)	Henry High School Route 29	Ill. EPA/Mr. Guyer	N. 4554092 E. 301098	20	SN ₂ /NN ₂ (Bubbler)
PUTNAM COUNTY		ļ			
Hennepin (6420 005)	Kuhne Residence 5th and High	Ill. EPA/Mr. Kuhne	N. 4569197 E. 303709	6.5	TSP
72 PADUCAH-CAIRO INTERS	TATE (ILL KY.)	1.			
MASSAC COUNTY		*** 504/	N 4114400	40	TSD SQ_/NO_ /P-bb1a=}
Metropolis (5060 007)	Massac County Hospital	Ill. EPA/ Hospital	N. 4114493 E. 345493	40	TSP, SA ₂ /NO ₂ (Bubbler)

STATION	ADDRESS.	OWNER/ OPERATOR	UTM COORD.	SAMPLING HEIGHT (FEET)	EQUIPMENT
73 ROCKFORD-JANESVILLĒ-BĒLOIT INTERSTATĒ (1LL		wis.)			
<u>DeKALB COUNTY</u> DeKalb (1780 001)	Municipal Building 200 South 4th	III. EPA/DeKalb A&W Pol. Cont. Com.	N. 4642796 E. 354722	30	TSP
WINNEBAGO COUNTY Rockford (6680 005)	Pump House 1528 18th Avenue	Ill. EPA/ Winnebago Co. Health Dept.	N. 4679253 E. 328969	20	SO2/NO2 (Bubbler), SO2 (Continuous), O3, COH, WS/WD, Telemetry
Rockford (6680 008)	Jefferson High 2525 Ohio	Ill. EPA/ Winnebago Co. Health Dept.	N. 4678234 E. 331043	15	TSP
Rockford (6680 001)	Old City Hall 126 South 1st Street	Ill. EPA/ Winnebaqo Co. Health Dept.	N. 4681401 E. 327790	50	TŚP
74 SOUTHEAST ILLINOIS I	NTRASTATE				
EFFINGHAM COUNTY Effingham (2200 001)	USDA Building 1015 South Willow	III. EPA/Mr. Rexroat	N. 4330583 E. 366866	2N	TSP. Sn _Z /Nn ₂ (Bubbler)
JACKSON COUNTY Carbondale (NEW) (0840 002)	306 West Main Street	III. EPA/SIU	N. 4177660 E. 304518	30	TSP, SÖ2/NÖ2 (Bubbler)
JEFFERSON COUNTY Mt. Vernon (5420 002)	State Office Building 601 North 18th Street	III. EPA	N. 4243166 E. 332672	40	TSP
<u>WILLIAMSON COUNTY</u> Marion (4720 001)	State Office Building	Ill. EPA	N. 4177240 F. 327833	25	TSP, SO ₂ /NO ₂ (Bubbler). SO ₂ (Continuous), O ₃ ,
75 WEST CENTRAL ILLINOI	2209 West Main Street S INTRASTATE		E. 32/833		COH, WS/WD, Telemetry
ADAMS COUNTY					
Quincy (6440 002)	Central Fire Station 9th and Vermont	Ill. EPA/City -(Hi-Vol), Ill. EPA	N. 4421487 E. 636512	30	TSP, SO ₂ (Continuous), O ₃ , COH, WS/WD, Telemetry
Quincy (6440 003)	Sewage Plant	Ill. EPA/City	N. 4418679 E. 635629	20	TSP
Quincy (6440 004)	Ouincy College 18th and Elm	III. EPA/Quincy College	М. 4422123 Е. 637808	45	รถ ₂ /พก ₂ (Bubbler)
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STATION	ADDRESS	OWNER/ OPERATOR	UTM COORD.	SAMPLING HEIGHT (FEET)	EQUIPMENT
MACON COUNTY					
Decatur (1740 002)	Grant School 22nd and Geddes	Ill. EPA	N. 4413703 E. 335413	20	TSP
Decatur (DISC) (1740 003)	125 North Franklin	III. EPA	N. 4411900 E. 332900	37	TSP
Decatur (1740 004)	Harris School 600 East Garfield	III. EPA	N. 4414179 E. 333345	14	TSP
Decatur (1740 006)	Fire Station #4 2760 North 22nd Street	III. EPA	N. 4415382 E. 335364	25	SN ₂ (Continuous), N ₃ , CNR, WS/WD, Telemetry
Decatur (1740 007)	Fire Station #1 Franklin and Wood	Ill. EPA	N. 4411679 E. 333037	25	SO ₂ /NO ₂ (Bubbler)
Decatur (NEW) (1740 008)	Jasper and Orchard	Ill. EPA	N. 4412975 E. 334055	30	TSP
Decatur (NEW) (1740 009)	750 E. Lake Shore Drive	III. EPA	N. 4410043 E. 333574	25	TSP
MENARD COUNTY Petersburg (6170 001) SANGAMON COUNTY	7th & Jackson	III. ÉPA	N. 4432518 E. 256722	15	TSP
Springfield (7280 001)	Municipal Building 8th and Monroe	U.S. EPA/City Dept. of Public Health & Safety	N. 4408604 E. 273419	20	TSP
Springfield (7280 003)	224 West Adams	I11. EPA	N. 4408808 E. 272462	15	TSP, SO ₂ /NO ₂ (Bubbler), SO ₂ (Continuous), NO/NO ₂ (Continuous), CO, O ₃ , RHC, COH, WS/WD, Meteor., Telemetry

EQUIPMENT CODE SYMBOLS

TSP - Total Suspended Particulate 502 - Sulfur Dioxide NO - Nitric Oxide

NO2 - Nitrogen Dioxide CO - Carbon Monoxide

03 - Ozone RHC - Reactive Hydrocarbons

THC - Total Hydrocarbons

THC - Total Hydrocarbons
CH4 - Methane
COH - Coefficient of Haze
WS/WD - Wind Speed and Direction
Meteor. - Meteorological Parameters
(eg. Rain Fall, Atmospheric Pressure,
Solar Radiation, Temperature)

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n - instrument installed during 1977 d - instrument removed during 1977 NEW - site started in 1977 DISC - site discontinued in 1977

UTM .COORD.

N. - Northing Coordinates E. - Easting Coordinates

3.26 DIRECTORY OF SPECIAL PURPOSE AND INDUSTRIAL MONITORING SITES OPERATED DURING 1977

Following is a directory showing the special purpose sites operated by the Illinois Environmental Protection Agency as well as privately operated monitoring sites.

				SAMPLING	
STATION	ADDRESS	OWNER / OPERATOR	UTM COORD.	HEIGHT (FEET)	EQUIPMENT
65 BURLINGTON-KEOKUK IN	TERSTATE (ILL IND.)				
PEORIA COUNTY					
Starr (6080 900)	Peoria County	Commonwealth Edison-Cilco	N. 4505750 E. 277225	13	SO _Z (Continuous), TSP
Allied Mills (6100 900)	Peoria County	Commonwealth Edison-Cilco	N. 4502550 E. 273820	13	SO ₂ (Continuous), TSP
Keystone (6100 901)	Peoria County	Commonwealth Edison-Cilco	N. 4501360 E. 277480	13	SO ₂ (Continuous), TSP
State Hospital (6100 902)	Peoria County	Commonwealth Edison-Cilco	N. 4501740 E. 274720	13	SO ₂ (Continuous), TSP
Limestone (6100 903)	Peoria County	Commonwealth Edison-Cilco	N. 4500990 E. 275550	13	SO ₂ (Continuous), TSP
Ozařk (6100 904)	Peoria County	Commonwealth Edison-Cilco	N. 4501530 E. 273350	13	SO ₂ (Continüõus), TSP
Hurst (6100 905)	Peoria County	Commonwealth Edison-Cilco	N. 4497030 E. 273530	1,3	SO2 (Continuous), TSP
Boswell (6100 906)	Peorla County	Commonwealth Edison-Cilco	N. 4495270 E. 268480	13	SO ₂ (Continuous), TSP
Gebhart (6100 907)	Péciria County	Commonwealth Edison-Cilco	N. 4495460 E. 270250	13	SO ₂ (Continuous), TSP
TAZEWELL COUNTY					
Lawndale (6060 900)	Pekin	Commonwealth Edison-Cilco	N. 4495460 E. 277240	13	SO ₂ (Continuous), TSP
Park (6060 901)	Pekin	Commonwealth Edison-Cilco	N. 4494070 E. 277360	13	SO ₂ (Continuous), TSP
Lutz (7600 900)	Tazewell County	Commonwealth Edison-Cilco	N. 4486660 E. 270650	13	SO ₂ (Continuous), TSP
Garman (7600 901)	Tazewell County	Commonwealth Edison-Cilco	N. 4485920 E. 271050	13	SO ₂ (Continuous), TSP
66 EAST CENTRAL ILLINO	IS INTRASTATE				
CHAMPAIGN COUNTY					
Champaign (1140 003)	WCIA-TV Studio 509 South Neil Street	III. EPA	N. 4440586 E. 393993	15	03
67 METROPOLITAN CHICAGO) INTERSTATE (ILL. + IND.) .			
COOK COUNTY		***	u ******		0-
Arlington Heights (0200 002)	33 S. Arlington Hts. Road	III. EPA	N. 4659111 E. 418716	30	03
Des Plaines (Disc.) (1840 001)	Main West High School 1755 South Wolf Road	Ill. EPA	N. 4652290 E. 424858	32	03
Evans ton (2360-002)	Water Pumping Station 531 East Lincoln	I11. EPA	N. 4656685 E. 444098	30	03
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		1			03 03 03

STATION	ADDRESS	OWNER/ OPERATOR	UTM COORD.	SAMPLING HEIGHT (FEET)	EQUIPMENT
Chicago: University of Chicago	1525 East Hyde Park Blvd.	III. ĒPA	N. 4627950	40	03
(Disc.) (1220 034) Dupage County			E. 45895		
Wheaton (8220 003)	111 North County Farm Road	I11. EPA	N. 4634987 E. 4059 9 3	49	03
KANKAKEE COUNTY Kankakee (3820 001) LAKE COUNTY	City Hall, Room 218 209 North Indiana Avenue	III. EPA	N. 4552172 E. 427777	35	03
LAKE COUNTY Libertyville (4260 001)	Butterfield School 1441 Lake	III. EPA	N. 4682166 E. 418416	25	03
Waukegan (8020 002)	North Fire Station Golf and Jackson	III. EPA	N. 4693283 E. 430283	. 30	03
Lewis Site (8020 006)	Waukegan	Commonwealth Edison	N. 4692400 E. 429100	15	TSP, SO ₂ (Continuous)
Headquarters Site (8020 007)	Waukegan	Commonweal th Edison	N. 4694900 E. 426000	15	TSP, SO ₂ (Continuous)
MC HENRY COUNTY McHenry (Disc.) (4520 001)	Police Station 1111 North Green Street	INT. EPA		30	03
	IS INTERSTATE (ILL MO.)			i.
MADISON COUNTY Granite City (Disc.) (2960 013)	Lincoln and Nameoki	Ill. EPA/Granite City APC	N. 4287400 E. 750500	15	TSP
Granite City (2960 014)	Norfolk and Western	Ill. EPA/Granite City APC	N. 4286388 E. 749888	15	ŤSP
Granite City (New)	23rd and Nameok1	Ill, EPA/Granite City APC	N. 4287395 E. 750327	15	TSP
Granite City (New) (2960 017)	19th and Adams	Industrial	N. 7287425 E. 747629	15	TSP
71 NORTH CENTRAL ILLINO BUREAU COUNTY	IS INTRASTATE				
DePue (0680 005)	S.W. Corner of Plant	Mobil Chemical	N. 4577240 E. 306660	15	SO ₂ (Continuous)
DePue (0680 006)	White City Park	Mobil Chemical	N. 4577518 E. 308203	15	SO ₂ (Continuous)
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STATION	ADDRESS	OWNER/ OPERATOR	UTM COORD.	SAMPLING HEIGHT (FEET)	EQUIPMENT
LASALLE COUNTY	·				
Oglesby (New) (5800 002)	Jasper Yard 230 Portland	III. EPA	N. 4573135 E. 328364	6.5	TSP
Oglesby (New) (5800 003)	Fire Station 110 W. 2nd Street	III. EPA	N. 4573123 E. 327345	18	TSP
Oglesby (New) (5800 004)	Kasap Lot Maple and Watson	III. EPA	N. 4573123 E. 328067	6.5	TSP
0glesby (5800 005)	1098 East Walnut	Ill, EPA	N. 4573150 E. 32700	30	ws,wd
72 PADUCAH-CAIRO INTERS	TATE (ILL KY.)				
MASSAC COUNTY					
Station 10 (4900 001)	Massac County	TVÄ	N. 4116530 E. 344760	12	TSP, SO ₂ (Continuous)
Station 11 (5060 006)	Metropolis	TVA	N. 4113250 E. 345400	12	TSP, 50 ₂ (Continuous)
Station 16 (4900 002)	Massac County	TVA	N. 4118250 E. 338720	12	SO2 (Continuous)
Station 17 (4900 003)	Massac County	TVA	M. 4119940 E. 348840	12	SO ₂ (Continuous)
Station 18 (4900 004)	Massac County	TVA	N. 4116370 E. 348700	12	SO ₂ (Continuous)
Station 19 (4900 005)	Massac County	TVA	N. 4120180 E. 342600	12	SO ₂ (Continuous)
73 ROCKFORD-JANESVILLE-	BELOIT INTERSTATE (ILLW	is.)			
Dekalb County					
DeKalb (1720 002)	Faraday Hall Chemistry Department	Ill. EPA	N. 4643672 E. 353327	25	03: -
75 WEST CENTRAL ILLINOIS	INTRASTATE				
MONTGOMERY COUNTY					
Zenobia (5220 001)	Montgomery County	Commonwealth Edison	N. 4377900 E. 280600	18	SO ₂ (Continuous)
HACON_COUNTY					
Decatur (New) (1740 010)	24th and Locust	III. EPA	N. 4413302 E. 335827	15	TSP .
Decatur (New) (1740 011)	Condit Street Torrence Park	III. EPA	N. 4413055 E. 334839	15	TSP, WS, WD
CHRISTIAN COUNTY					
Edinburg (1320 001)	Christian County	Commonwealth Edison	N. 4391960 E. 292560	18	SO ₂ (Continuous)
Sangchris (1320 002)	Christian County	Commonwealth Edison	N. 4388200 E. 285650	18	SO ₂ (Continuous)
					TSP. WS, WD SO ₂ (Continuous) SO ₂ (Continuous)

STATION	ADDRESS	OWNER/ OPERATOR	UTM COORD.	SAMPLING HEIGHT (FEET)	EQUIPMENT
	<u>-</u>		-		
Clark (1320 003)	Christian County	Commonwealth Edison	N. 4383000 E. 285700	18	SO ₂ (Continuous)
Kincaid (1320 004)	Christian County	Commonwealth Edison	N. 4382860 E. 289850	18	SO ₂ (Cantinuous)
Jetsyvt11e (1320 005)	Christian County	Commonweal th	N. 4382480 E. 294830	18	SO ₂ (Continuous)
Clear Creek (1320 006)	Christian County	Commonwealth Edison	N. 4375920 E. 288160	18	SO ₂ (Continuous)
<u>sangamon county</u>				:	
Springfield (7280 004)	WTAX-WDBR Radio Station 712 South Dirksen Parkway	III. ÉPA	N. 4407700 E. 277700	15	SO ₂ (Continuous)
Pawniee (6980 003)	Sangamon County	Commonwealth Edison	N. 4385230 E. 278000	18	SO ₂ (Continúous)
New City (6980 001)	Sangamon County	Commonwealth Edison	N. 4396610 E. 281960	18	SO ₂ (Continuous)
Cascade (6980 002)	Sangamon County	Commonweal th Edison	N. 4395590 E. 286070	18	SO ₂ (Continuous)

3.3 AMBIENT AIR SAMPLING METHODOLOGIES

The Illinois Ambient Air Monitoring Network is essentially two networks—one noncontinuous or intermittent, the other continuous. Noncontinuous samplers are generally used to measure average air quality over time periods of twenty-four hours and have restricted utility for measuring short-term variations in air quality. Continuous samplers on the other hand perform constant surveillance and easily accommodate averaging periods of one hour. Continuous instruments are, therefore, necessary in areas of potential rapidly changing air quality and for measurements involving short-term (24 hours or less) ambient air standards. Continuous instruments are also necessary in situations requiring real time data for the control of air pollution episodes.

The noncontinuous network is comprised of total suspended particulate (TSP) and gas impinger samplers. These instruments are operated on a USEPA coordinated sampling schedule involving a 24-hour period every six days. Within Illinois, the city of Chicago and Cook County agencies operate on a schedule of twice the USEPA frequency obtaining noncontinuous samples every three days.

Continuous measurements are made for sulfur dioxide, nitrogen oxides, carbon monoxide, ozone and reactive hydrocarbons with the majority of these sensors responding real time via a telemetry network. New continuous instrumentation used in the measurement of ambient concentration of criteria air pollutants is required to be designated a reference or equivalent method by the U. S. Environmental Protection Agency as of February 18, 1976. Continuous equipment existing prior to that date can continue to be used until February 18, 1980 under the provisions of this regulation. (Fed. Reg. - Tues., Feb. 18, 1975, p. 7044) Table 5 of this section contains a listing of approved continuous instruments for sulfur dioxide, ozone, carbon monoxide, and nitrogen dioxide. At present no reference method for monitoring reactive hydrocarbons is available.

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NONCONTINUOUS INSTRUMENTATION

TOTAL SUSPENDED PARTICULATE (TSP) SAMPLERS

Eight by ten inch glass fiber filters are conditioned to reach a stabilized moisture content after which their weight is accurately determined. The filters are then placed on a hi-volume sampler with air drawn through them at the rate of 40 to 60 cubic feet per minute for 24 hours. These instruments ordinarily operate on a midnight to midnight schedule. The exposed glass filters are then returned to the conditioning environment and allowed to re-equilibrate with respect to moisture content. When this equilibrium has been reached, the filters are reweighed. The differential weight is divided by the total air flow to yield a concentration in particulate weight per volume of air sampled (micrograms of TSP per cubic meter of air). In general, particles between 0.1 and 100 microns in diameter can be collected. (Fed. Reg. - Thurs., Nov. 25, 1971, pp. 22388-90)

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IMPINGER (BUBBLER) SAMPLERS

These intermittent samplers are used to measure sulfur dioxide and nitrogen dioxide levels in ambient air. Ambient air is drawn through a solution where the pollutant in question is selectively absorbed with high efficiency. Air flows through the absorbing solutions at a rate of 0.2 liters per minute for a sampling period of 24 hours. After a sample is collected, the solutions are returned to the laboratory for analysis. Due to thermal instablity and time decomposition of the collected samples the impinger (bubbler) samplers have been discontinued by the Illinois Environmental Protection Agency as of January 1, 1978. They will be replaced, where required by the implementation plan, with continuous instrumentation.

Sulfur Dioxide Analysis

The absorbing solution for sulfur dioxide is a tetrachloromercurate solution. The absorbed sample is analyzed for sulfur dioxide concentration using the paraosaniline reference procedure outlined in the Federal Register. (Fed. Reg. - Wed., Aug. 13, 1975, pp. 34024-5) The concentration in solution, divided by the air flow, times the gas factor for sulfur dioxide gives the concentration of sulfur dioxide in parts per million for that sampling period.

Nitrogen Dioxide Analysis

The absorbing solution for nitrogen dioxide sampling is a sodium hydroxide-sodium arsenite solution and the absorbed sample is analyzed using the manual equivalent procedure specified in December, 1977. (Fed. Reg. - Wed., Dec. 14, 1977, pp. 62972) The solution is analyzed for concentration of nitrogen dioxide by a colorimetric method and the concentration in solution, divided by the air flow, times the gas factor gives the ambient concentration of nitrogen dioxide in parts per million.

METALS CONTENT OF PARTICULATE SAMPLES

Portions of exposed hi-vol filters are subjected to chemical digestion followed by an analysis by atomic absorption for various metals. These analyses are done on individual filters and in some cases on composites (all filters for a calendar month are combined and analyzed to provide a monthly average). Ambient concentrations of copper, cadmium, lead, zinc, arsenic, manganese, nickel and chromium are routinely determined and reported as micrograms of the metal per cubic meter of air.

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CONTINUOUS INSTRUMENTATION

TSP TAPE SAMPLERS (Hemeon and Ide, 1953)

Ambient air is drawn through a paper tape filter at a flow rate of 0.22 cubic feet per minute (CFM) for a variable period (generally two hours). The percent of light transmittance through the tape is continuously monitored. The decrease in percent transmission with time is related to the collection of particulate matter on the filter tape and is termed coefficient of haze (COH). A comparison between results obtained from hi-volume samplers and tape sampler found widely varing correlations. This is apparently because of the optical properties associated with particles collected by the tape sampler. Rough correlations, however, between the two methods use 125 micrograms per cubic meter TSP as equivalent to 1 COH. Following the sampling period, the paper tape advances to a clean spot and the sampling cycle begins again. Due to variances caused by color and size of material collected and the inability to correlate data with hi-volume sampler data, the TSP tape samplers have been discontinued by the IIllinois Environmental Protection Agency as of January 1, 1978. Various real time continuous particulate samplers are under investigation to find a replacement sampler which will provide data comparable to the hi-volume. These new instruments should be operational by August 1978.

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SULFUR DIOXIDE

A. Colorimetric Monitors

Ambient air is drawn through an absorbing column where it is continuously mixed with a solution of tetrachloromercurate absorbing the sulfur dioxide. A portion of this solution is mixed with formaldehyde, sulfamic acid, and pararosaniline dye and allowed to flow through a time delay coil where mixing and chemical reaction between the sulfur dioxide and the analytical reagents take place. The resulting dye complex is spectrophotometrically analyzed using a riow cell colorimeter at a specific wavelength. The change in percent transmission of the solution is related to concentration of sulfur dioxide in the ambient air. This ambient analysis procedure is identical to the reference procedure EQS-0775-001 (analysis of manually collected samples, i.e. impingers) with the exception that an absorbing coil is used to obtain a continuous sample.

B. Coulometric Monitor

Ambient air is drawn through an acid solution of bromine and bromide ions. The reaction between sulfur dioxide and bromine results in a shift of electrical equilibrium in the solution. The electrical current required to reform sufficient bromine from the bromide ions to re-establish the original equilibrium is proportional to the sulfur dioxide concentration in the ambient air sampled.

C. Pulsed Fluorescent Monitor

Ambient air is drawn into a chamber where it is pulse irradiated with ultra-violet light of a specific wavelength. The sulfur dioxide molecules present absorb photons of energy from this light. When these excited molecules revert back to their original energy state, they release energy in the form of light and the intensity of the emitted light is measured and converted into a sulfur dioxide concentration.

D. Flame Photometric Detector Monitor

Ambient air is drawn into a chamber where it is burned in a hydrogen hyperventilated air diffusion flame. The luminescence resulting from the reaction of the ambient sulfur molecules with the flame is absorbed by a photomultiplier detector. The resulting output from this detector is related to the sulfur dioxide concentration in the ambient air.

E. Second Derivative Spectrophotometric Monitor

Ambient air is drawn through a sample chamber into which ultra-violet light at a particular wavelength is directed. The second derivative spectrum of this beam is monitored continuously at a particular wavelength. The intensity of this spectrum is related to concentration of sulfur dioxide in the ambient air.

NITROGEN DIOXIDE (Chemiluminescent Monitor)

A. Single Channel, Single Detector

Ambient air is drawn into the unit by two paths. In one path, the sample is exposed to ozone directly and the light produced by the reaction between nitric oxide (NO) and ozone is measured and calculated as nitric oxide concentration in ambient air. In the other path, the sample passes through a converter changing quantitatively the oxides of nitrogen (NO_x) in the sample into nitric oxide (NO). This sample is then exposed to ozone and the light produced by the chemiluminescence measured and calculated as total oxides of nitrogen concentraton in ambient air. These measurements are made alternately and then either subtracted electronically or manually to give the concentration of nitrogen dioxide in the ambient air.

B. Dual Chamber, Single Detector

The chemilumenescence reaction and detection method is the same as in "A" above, except that samples of ambient air are made simultaneous for both the nitric oxide and total oxides of nitrogen measurements rather than alternating back and forth. The detector observes the reaction chambers alternately and the results are calculated as before to give the concentration of nitrogen dioxide in the ambient air.

C. Dual Chamber, Dual Detector

The chemilumenescence reaction is the same as in "A" and "B" above, except that each of the chambers operates with its own independent detector; one measuring nitric oxide and the other measuring total oxides of nitrogen. Again, the results are calculated as before to give the concentration of nitrogen dioxide in the ambient air.

REA

OZONE

A. Ultra-Violet Absorption Monitor

Ambient air is drawn through a sample chamber into which a beam of ultra-violet light of a particular wavelength is passed. This beam is monitored continuously for any decrease in intensity which is due to the absorption of incident light by ozone molecules present in the air. The decrease in light transmittance is translated into ozone concentration in the ambient air.

B. Chemiluminescent Monitor

Ambient air is drawn into a reaction chamber where the sample is mixed with ethylene gas. Ozone reacts quantitatively with the ethylene to produce light which is detected by a photodetector and its intensity related to the concentration of ozone in the ambient air.

CARBON MONOXIDE

A. Non-Dispersive Infrared (NDIR) Monitor

Ambient air is drawn through a sample chamber into which a beam of infrared light at a particular wavelength is passed. This beam is continuously monitored and any decrease in intensity at the specific wavelength is due to the absorption of light by the carbon monoxide molecules present. This decrease is directly related to the concentration of carbon monoxide in the ambient air.

B. Gas Chromatograph-Flame Ionization Monitor

Ambient air is drawn through a gas chromatographic column where the carbon monoxide component is separated from the other components. The carbon monoxide is then reduced to methane and burned in a hydrogen flame. The change in the electro-potential of the collector due to the increase ionization produced by this burning is translated into a concentration of carbon monoxide in ambient air.

REACTIVE HYDROCARBON (TOTAL HYDROCARBON LESS METHANE) MONITORS

A. Gas Chromatography-Flame Ionization Detection

Ambient air is drawn through a chromatographic column where the hydrocarbon component is then divided; one portion is totally converted to methane and introduced into a flame, the other portion is pretreated so that only the ambient methane component of the hydrocarbon sample is separated and introduced into the flame. In the flame, the burning of the methane results in a change in the electro-potential of the collectors due to the increased ionization which is correlated to the concentration of methane and total hydrocarbon as methane depend upon the portion analyzed. Using either an electronic subtraction circuit or manual subtraction, the value for the concentration of reactive hydrocarbons in ambient air is determined.

TABLE 5
LIST OF DESIGNATED REFERENCE AND EQUIVALENT METHODS (12-31-77)

Designation		_	Federal Registe	
<u>Number</u>	Identification	Source	Vol.	Page
Sulfur Dioxide EQS-0775-001	Pararosaniline Method Technicon I (Auto-Analysis of Manually Collected Samples)	Technicon	40	34024
EQS-0775-002	Pararosaniline Method Technicon II (Auto-Analysis of Manually Collected Samples)	Technicon	40	34024
EQSA-1275-005	SM 1000 Secord Derivative Spectrophotometer)	Lear Siegler	41	3893
EQSA-1275-006	SA 185-2A (Flame Photometric)	Meloy	41	3893
EQSA-0276-009	43 (Pulsed Fluorescense)	Thermo Electron	41	8531
EQSA-0676-010	PW 9755 (Coulometric)	Philips	41	26252
EQSA-0876-011	PW 9700 (Coulometric)	Philips	41	34105
EQSA-0876-013	8450 (Flame Photometric)	Monitor Labs	41	36245
EQSA-0877-024	500 (Coulometric)	Asarco	42	44264
Carbon Monoxide RFCA=0276-008	8501-5CA (NDIR)	Bendix	41	7450
RFCA-0876-012	866 (NDIR)	Beckman	41	36245
RFCA-0177-018	202S (NDIR)	Mine Safety	42	5748

TABLE 5 (cont)
LIST OF DESIGNATED REFERENCE AND EQUIVALENT METHODS
(12-31-77)

Designation			leral Regis	
Number	Identification	Source	Vol.	Page
Ozone RFOA-1075-003	QA 325-2R (Chemiluminëscënse)	Meloy	40	54856
RF0A-1075-004	QA 350-2R (Chemiluminescense)	Meloy	40	54856
RF0A-0176-007	8002 (Chemiluminescense)	Bendix	41	5145
RF0A-1076-014 RF0A-1076-015 RF0A-1076-016	1100-1 1100-2 1100-3 (Chemiluminescense)	McMillan	41	466747
RF0A-1176-017	8410Ē (Chemiluminescense)	Monitor Labs	41	53684
EQOA-0577-019	1003-AH (UV Absorption)	Dasibi	42	28571
RF0A-0577-020	950A (Chemiluminescense)	Beckman	42	28571
EQOA-0777-023	PW9771 (UV Absorption)	Philips	42	38931
Nitrogen Oxides RFNA-0677-021	8440E (Chemiluminescense)	Monitor Labs	42	37434
RFNA-0777-022	8101-C (Chemiluminescense)	Bendix	42	37435
ŘFNA-0977-025	1600 (Chemiluminescense)	Columbia Scientific Instruments	42	46574
EQN-1277-026 EQN-1277-027 EQN-1277-028	Sodium Arsenite Method (3) (Auto-Analysis of Manually Collected Samples)	Technicon	42	62972

3.4 QUALITY ASSURANCE PROGRAM

The Illinois Environmental Protection Agency's Quality Assurance Program for Ambient Air Monitoring had its conceptual beginning in November of 1974, with a submittal to the USEPA, Region V of a role document for Quality Assurance. This document was prepared as a result of a condition to the State of Illinois's Clean Air Act Maintenance Grant. This effort was followed in 1975 with a detailed developmental effort to formulate an Operations and Procedures Document for the actual implementation of the Quality Assurance Program. The formal Quality Assurance Program was begun in January, 1976 with the issuance of an annual inspection schedule for State and local agency air monitoring activities. In March, 1976, the final Quality Assurance Program document was completed and submitted to the USEPA, Region V for review and approval after developmental input was received from the Cook County and Chicago Departments of Environmental Control.

During the course of 1976, thorough, comprehensive inspections of the air monitoring activities of the Illinois EPA and local agencies were performed. These assessments were of multiple benefit, as they provided the Illinois EPA with an enhanced insight into the actual operating methods used in the various air monitoring programs in the State; permitted operational deficiencies and deviations from Federal Register requirements to be determined; motivated corrective actions, improved methods, and procedural changes; improved coordination between State and local agencies; established credibility and confidence in the objectives and goals of the Quality Assurance Program; and established a guideline for quality assurance activities at the State and local agency levels.

This year the IEPA Quality Assurance Program expanded in many aspects. Additional local agency and industrial network monitoring activities were included in the annual inspection schedule for the first time, increased emphasis was placed on audits of continuous monitoring instruments throughout the State, and new calibration equipment with increased accuracy and reliability was purchased. There has been greatly increased coordination between the State Agency and the local agencies in the development of Quality Assurance Programs which suit the particular agency needs and permit documented and traceable verification of the collected data. It is anticipated that comprehensive, productive, and completely documented quality assurance programs will be in force by December 31, 1978 in all of the air pollution agencies within the State of Illinois.

During 1977, 137 individual monitoring sites throughout the state was assessed in accordance with the annual inspection schedule, and a spotcheck inspection was conducted at two additional monitoring sites. The Quality Assurance Office completed an independent audit of CO monitors throughout the State, which had begun in the Chicago area during the latter part of 1976. A special audit was also conducted of 16 of the Illinois EPA ozone monitoring sites. In addition, the Quality Assurance Office again participated with the USEPA, Region V in an audit of noncontinuous sites operated by both the State and local agencies.

The State <u>Interlaboratory Proficiency Testing Program</u>, which was initiated in March of 1976, was continued through 1977. The program had been expanded over the year to include hi-vol filter weighing and the analysis of heavy metals, sulfates and nitrates, as collected on hi-vol filters. This program has been of continuing benefit in terms of ascertaining the degree of correlation between analyses performed by the participating laboratories.

It should be noted that those operational deficiencies, procedural errors, and noncompliance with Federal Register requirements which were discovered in the course of quality assurance inspections and audits, have been thoroughly evaluated in order to determine the extent of their effects on the validity of the data collected. The inspections and audits conducted during 1977 have caused specific deficiencies to be corrected, procedures to be improved, and methods optimized. The Quality Assurance Program has proven effective and valuable in permitting accurate definitive judgments of the validity of data collected from monitoring sites in the State. Through allocation of additional resources, and more frequent and in-depth inspections and audits, a better definition of data accuracy and precision is anticipated.

4.0 STATEWIDE SUMMARY OF AIR QUALITY DATA - 1977

4.1 AIR QUALITY DATA INTERPRETATION

Ambient air measurements are used as the basis for understanding and evaluating air quality. To ensure optimum use of these measurements, the Agency periodically reviews the deployment of sensors in its air monitoring network. Nevertheless, no finite number of samplers can completely document air quality. Ambient air pollution measurements should be used in conjunction with meteorological and emission data and mathematical modeling to yield a more comprehensive understanding of a given region.

In order to provide a uniform procedure for determining whether a sufficient amount of air quality data has been collected by a sensor in a given time period (year, quarter, month, day, etc.) to be representative of that time period, a minimum statistical culling criteria was developed.

In order to calculate an annual average for noncontinuous sites, a minimum of 20 samples is necessary. Each quarter must contain at least 5 samples and within any quarter, if one of the months has no samples, then neither of the other two months can have less than 2 samples.

To determine an annual average for continuous data 75% of the total possible yearly observations are necessary, i.e., a minimum of 6570 hours were needed in 1977. In order to provide a balance between the respective quarters, each quarter must have at least 1300 hours which is 20% of the 75% minimum annual requirement.

To calculate quarterly averages at sites which do not meet the annual criteria, 75% of the total possible observations in a quarter are needed, i.e., a minimum of 1647 hours in 1977.

Monthly averages also require 75% of the total possible observations in a month, i.e., 540 hours as a minimum.

Additionally, for short-term running averages (24 hour, 8 hour, 3 hour) 75% of the data during the particular time period is needed, i.e., 18 hours for a 24-hour average, 6 hours for an 8-hour average and 3 hours for a 3-hour average.

Data listed as not meeting minimum statistical culling criteria in this report were so noted after evaluation using the criteria above.

The criteria for calculating a valid annual average requires 75% of the number of hours in the year (6570 hours for 1977). Although short term averages (3, 8, 24 hours) have been computed for certain sites not meeting the annual criteria, these averages may not be representative of an entire year's air quality. In certain circumstances where even the 75% criteria is met, the number and/or magnitude of short term averages may not be directly comparable from one year to the next because of distributional differences.

For summary purposes, the data is expressed in the number of significant figures to which the raw data is validated. Extra figures may be carried in the averaging technique, but the result is rounded to the appropriate significant figures. For example, the values 9, 9, 10 are averaged to give 9; whereas the values 9.0, 9.0, 10.0 are averaged to 9.3. The raw data itself should not be expressed to more significant figures than the sensitivity of the methodology allows.

Five of the six National Ambient Air Quality Standards (NAAQS) -- suspended particulate (TSP), sulfur dioxide (SO₂), carbon monoxide (CO), photochemical oxidants and non-methane hydrocarbons (N-MHC) -- have short-term ambient air concentrations (24 hours or less) not to be exceeded more than once per year. The standards are promulgated in this manner in order to protect the public from excessive levels of pollution both in terms of acute and chronic health effects.

Air pollution itself is a highly variable phenomenon. Some of the factors effecting pollution concentrations are (a) meteorological: atmospheric stability, wind speed and direction, precipitation, solar radiation, temperature, etc.; (b) geographical: urban or rural, valleys or plains and (c) economic: concentrations of industries, boom or recession, weekday or weekend. These variations often can be discerned as a pattern on a diurnal, seasonal or longer range basis.

Interpretation of data must necessarily consider the question of how well the air quality data represents the actual air quality. Certain statistical procedures are useful in describing and interpreting air quality data. Some of the formulas used in the compilation of this report, along with examples of their use, are given in Appendix A.

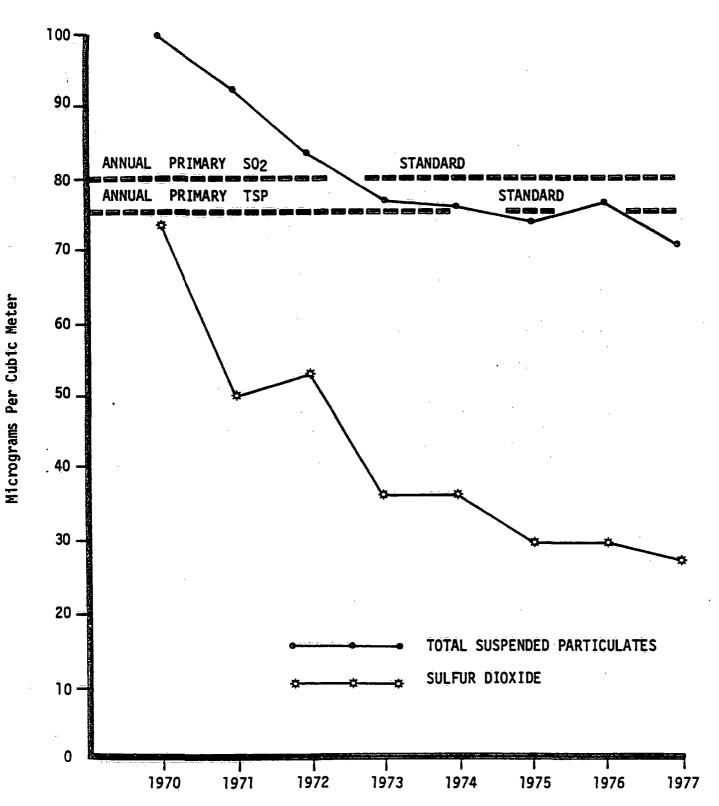
It is generally assumed that, if an instrument monitors continually, at the end of the year the air quality at that site is completely specified to within the accuracy of the instrument. However, monitors for suspended particulates and the SO2/NO2 bubblers operate on a noncontinuous basis--generally once every six days or in some cases every three or every twelve days. In these situations, there is a question

regarding how well the non-continuous data describes the air quality on days when monitoring is not conducted. Following Hunt (1972), confidence intervals can be determined for the noncontinuous data with the resultant true annual mean falling within a determined range at this specified confidence level.

Larsen (1971) indicates that the distribution of pollutant concentrations measured throughout the year is in many instances log-normal, i.e., the logarithm of the concentrations follows the well known normal distribution. Thus normal statistics can be applied to these cases. The pertinent parameters used in describing a log-normal distribution are the geometric mean, which specifies the central tendence (50th percentile point) of the values and the geometric standard deviation which specifies the spread of the distribution. A large geometric standard deviation indicates a large spread in the data. As an example, if every value for the year was identical, there would be no spread and the geometric standard deviation would be 1.0.

Once data has been compiled over a period of years, it is possible to determine trends mathematically. The Daniel's Test using the Spearman Rank Correlation Coefficient as described and recommended in Guidelines for the Evaluation of Air Quality Trends (OAQPS No. 1.2-014) can be used for these determinations. (See Appendix A for an example calculation using this method). A minimum of four years of valid data are required to use this method. A significant result either upward or downward indicates only the consistency of the direction of the change and not the magnitude of the change. In order to estimate the magnitude of the trend, it is necessary to apply a linear regression (least-squares fit) to the data. The result is the average rate of change over the time period of interest. Care should be exercised in the use of calculated The factors contributing to the existence or absence of a trend at one site could be totally different than those contributing at another site. In fact, over a period of years, a site can show no trend by the statistical technique mentioned above, and yet have an overall decrease in concentration levels. This would indicate that the direction of the yearly changes have not been consistent. Thus each site should be completely analyzed before final conclusions are drawn.

FIGURE 1
STATEWIDE POLLUTION TRENDS*



^{*}Arithmetic average of annual geometric means of all sites which have valid annual averages in each year.

4.2 TOTAL SUSPENDED PARTICULATE SUMMARIES

Figure 1 shows the statewide trend for suspended particulates from 1970 through 1977. The statewide average in each year is an arithmetic mean of the annual geometric means of all sites having valid annual averages in that year (see section 4.1). The eight year trend since 1970 is downward. The magnitude of the trend was greater from 1970 through 1973 than it has been for the period from 1973 to the present. The statewide average for 1977 was 70 ug/m^3 compared to 76 ug/m^3 in 1976. Running geometric means from the fourth quarter 1976 through the first three quarters 1977 indicated a statewide average of 75 ug/m^3 , consistent with that of 1976. Thus, the difference in the statewide average between 1976 and 1977 is strictly the result of lower concentrations existing in the fourth quarter of 1977 compared to the same time period in 1976.

Table 6 is the ranking (highest to lowest) of the 130 sites having valid annual averages in 1977. Of these 130 sites, 42 (32%) are in excess of the primary annual standard of 75 ug/m^3 and another 32 (25%) are in excess of the annual secondary standard of 60 ug/m^3 . In comparison to 1976, the number of sites in excess of the annual secondary standard (but not in excess of the annual primary standard) decreased by 8%; while the number of sites in excess of the annual primary standard decreased by 7%.

The highest annual average was $186~\text{ug/m}^3$ recorded at 2001 East 20th Street in Granite City. This site has had the highest annual average in the state since 1972. The second highest site was Washington High School, in Chicago, with 170 ug/m^3 . The lowest annual mean was 39 ug/m^3 recorded in Evanston and Winnetka.

Table 7 lists the sites recording excursions of the 24-hour primary standard of 260 ug/m^3 , the date of the excursion, and the concentration. During 1977, data were collected from 157 sites. Data from all of these sites were reviewed during the preparation of this table, although it may have represented only a portion of 1977. Thus, sites may be listed in Table 7 as exceeding the 24-hour primary standard but not in the table of rankings (Table 6) because of the lack of a sufficient number of samples to determine an annual average. Summarized on this basis a total of 41 sites (26%) recorded at least one excursion of the 24-hour primary standard. Of these 41 sites, 19 (12% of the total) recorded more than one excursion and thus are in violation of the standard. May was a particularly bad month with over one half of the sites that recorded excursions during the year recording at least one and approximately 25% of all excursions being recorded during this month. May was also unusual meteorologically in that it was much warmer and drier than normal. Several periods of stagnating conditions occurred resulting in poor dispersion. In addition, on January 28, during blizzard conditions eight sites in Chicago recorded excursions and many other sites in Chicago recorded concentrations in excess of 200 ug/m³. Unfortunately, only sites in Chicago were operating on that day so it is not known whether the situation occurred statewide.

The largest number of excursions of the 24-hour primary standard was 19 (18 violations) at Washington High School in Chicago, followed by 16 excursions (15 violations) at 2001 East 20th Street in Granite City and 11 excursions (10 violations) in Oglesby. Because of the different sampling schedules of these sites, the average number of sampling days between excursions should be used to normalize the results. On this basis 2001 East 20th Street in Granite City had 3.4 sampling days between excursions, Washington High School in Chicago had 5.9 and Oglesby had 10.5.

The highest 24-hour concentration recorded in Illinois in 1977 was 1106 ug/m^3 at Washington High School in Chicago. This site recorded a total of four values in excess of 600 ug/m^3 . The highest concentration next to Washington High School, was 592 ug/m^3 recorded at 2001 East 20th in Granite City.

4.3 SULFUR DIOXIDE SUMMARIES

Figure 1 shows the statewide trend for sulfur dioxide from 1970 through 1977. The statewide arithmetic average in each year is based on all sites having valid annual averages in that year. The trend has been definitely downward over the whole period with a leveling off since 1975. In 1977, the statewide average was 27 ug/m³ well below the primary annual standard of 80 ug/m³.

A total of 74 sites recorded valid annual averages for sulfur dioxide in 1977. The ranking of the annual averages (highest to lowest) is given in Table 8. The results in this Table are based on both continuous instruments (obtaining hourly averages) and gas bubblers (obtaining discrete 24-hour integrated samples). Of the 74 total sites, 24 are continuous and 50 are gas bubblers. By ranking, 16 of the highest 18 sites have continuous instruments. The relative ranking of sites throughout Table 8 may not be totally consistent, since studies have shown that the gas bubbler methodology, in field operation, produces a negative bias of as much as a factor of two. As a result, the Illinois EPA has discontinued the use of gas bubblers at the end of the calendar year 1977. In 1977 as in 1976, no sites were in excess of the annual primary standard; the highest average being recorded at Wood River with .025 ppm.

Table 9 lists the sites, time periods, and maximum concentrations when excursions of the 24-hour primary standard of 0.14 ppm were recorded. A total of six sites recorded at least one excursion of the standard but only one, Pekin, recorded more than one excursion (2 excursions resulting in 1 violation) and as such, is in violation of the standard. The highest 24-hour average was 0.228 ppm also recorded in Pekin. Sites in Blue Island and Wood River, which historically have recorded several excursions of the 24-hour standard in past years, recorded only one excursion each in 1977. There were no excursions of the 3-hour secondary standard recorded in the statewide (non-industrial) network.

4.4 NITROGEN DIOXIDE SUMMARIES

A total of 60 sites had valid annual averages for nitrogen dioxide in 1977. Table 10 lists the rankings (highest to lowest) of those sites. 1977 is the first year since nitrogen dioxide has been monitored in Illinois that no sites were in violation of the annual standard; one site, G.S.A. Building in Chicago equaled the standard but was not in violation. A total of 14 sites had annual averages in excess of 0.04 ppm. This result contrasts with 1976 when only 4 sites were in excess of 0.04 ppm. The following table lists the statewide average nitrogen dioxide concentrations since 1973.

Year	1973_	1974	1975	1976	1977
Statewide Average (ppm)	.031	.028	.030	.028	.033

The average has remained constant with minor fluctuations throughout the period.

In Table 10, 40 of the 60 sites are in the Metropolitan Chicago AQCR 67. Thus the statewide average is strongly biased to that area. In ranking, the first 37 sites are from AQCR 67 indicating that the greatest NO_2 concentrations exist in this region.

4.5 OZONÉ SUMMARIES

The most extensive ozone monitoring effort in Illinois history was conducted during the ozone season of April through October, 1977. A total of 35 locations had monitoring during at least part of the ozone season and generally complete coverage was provided at 32 of the sites. Ozone monitors were located in 9 of the 11 AQCR's with the most emphasis being given to the Metropolitan Chicago and St. Louis AQCR's.

The results of the 1977 monitoring again demonstrated the statewide nature of the ozone problem. Each of the 32 sites operating during the entire season recorded more than one excursion of the 1-hour primary standard of 0.08 ppm and as such was in violation of the standard. Overall, the 1977 ozone season was worse than past years with many more excursions of the standard being recorded and peak concentrations being generally equal to or greater than past years. In particular, as compared to 1976, there was a 135% increase in the average number of excursions per site.

One of the factors contributing to the increase was the unusual month of May 1977. Historically, the month of May has accounted for less than 10% of the total number of excursions during a season. However, in 1977 May accounted for over 40% of the annual excursions statewide. May was unusual meteorologically in that it was much warmer, had more sunshine and, had less precipitation than normal. In addition, there were three stagnation periods during the month. These factors are important in contributing to high ozone.

Quantitatively, Wood River had the largest number of excursions of the primary standard in the state with 388. The second highest number of excursions was 273 at Calumet City, followed by 261 at Kenwood High School in Chicago. The highest one-hour concentration ever recorded in Illinois was recorded at Waukegan with a value of .266 ppm. The only other site in the state to record hourly averages in excess of 0.200 ppm was Kenwood High School in Chicago with a maximum concentration of .241 ppm.

In 1977, major emphasis was placed on the issuing of ozone advisories to the public and the declaration of ozone alerts. During the period April 15th to October 15th a bulletin summarizing ozone conditions was transmitted each day to the news media in Illinois via a statewide weather teletype network. This Bulletin listed the highest ozone level reached on the previous day, the current day's high, a forecast for the next day, and a listing of all cities with ozone monitoring stations which had reached ozone advisory criteria that day. Advisory conditions occur when the ozone level reaches 70 parts per billion (ppb) for a two-hour average, and the weather forecast indicates that this level will reoccur the next day.

On 86 of 153 days, one or more cities were listed in the daily ozone summary as having reached advisory conditions and on 3 days all cities with monitors in the State were so listed. The City of Wood River, which is downwind of St. Louis, reached advisory conditions on 67 days during the year.

On twenty-one days during the year the ozone one-hour average rose above 170 ppb, the State's Yellow Alert level. On nineteen of these occasions the levels were not forecast to persist for 12 hours or reoccur the next day and therefore Yellow Alerts were not declared. On all nineteen occasions, the forecasts proved to be correct. In these cases, when yellow alert levels are reached but are not expected to persist or recur, the news media in the affected area are contacted and advised of the situation in order to provide warning to the Public.

On the two days during the year when the Yellow Alert level was reached and expected to recur the next day, Yellow Alerts were declared. These two ozone Yellow Alerts were the only actual air pollution episodes declared in Illinois during 1977. A summary of the Yellow Alerts follows.

Action During Ozone Yellow Alert Of May 19th, and 20th, 1977

On Thursday, May 19th, a slow moving high pressure system, had allowed an air mass to remain essentially unchanged in Illinois for 3 days, causing an increase in all air pollutants, especially in ozone. Sunny skies, warm temperatures, and light southerly winds dominated the State. The Kenwood High School Station in Chicago recorded a level of 207 ppb at 12 noon, followed by four hours above the Yellow Alert level. At 2:00 P.M., the Illinois EPA declared a Yellow Alert for Chicago south of the Stevenson Expressway and east of the Dan Ryan/Calumet Expressway. Ozone levels were elevated but did not exceed 170 ppb at Hillside, Calumet City and the Chicago Polk Street and Lindblom monitors.

Ozone concentrations dropped below the advisory level after sunset, that evening and on the 20th an approaching frontal system produced cloudy skies and thunderstorms. On this day, levels peaked at 1:00 P.M. at Kenwood with a reading of 86 ppb. At 2:00 P.M., May 20th, the Illinois EPA terminated the Yellow Alert but kept Chicago in "Ozone Advisory" status.

Actions during Ozone Yellow Alert of July 15th to 18th, 1977

On Friday, July 15th, ozone levels at the Wood River monitor climbed rapidly in the morning reaching 151 ppb at 11 A.M. Stagnant atmospheric conditions existed, with very warm temperatures and sunny skies.

Meteorologists from the National Weather Service, Murray & Trettle, (consultants of the Agency) and the Agency agreed that no significant change in conditions would occur during the next 24 hours. At 1:00 P.M., levels at Wood River reached 185 ppb, and a Yellow Alert for Madison County north of I-270, south of 140 and east of I-55 to the Mississippi River was declared. The Alert was effective until 6:00 P.M., the next day, July 16th.

On the 16th, ozone levels reached 178 ppb., and again the meteorologists forecasted no change, therefore the Yellow Alert was extended for 24 more hours - up to 6:00 P.M., July 17th.

A slight increase in windspeed on the 17th kept ozone levels slightly lower than on the previous two days, down to, 139 ppb, but since stagnant air was remaining in the area with no change forecasted, the Alert was continued another day.

On the 18th, ozone levels reached 127 ppb but this time wind speeds were forecasted to increase significantly and the Yellow Alert was terminated at 6:00 P.M. Wood River, however, was kept in "Ozone Advisory" status.

On Tuesday, July 19th, ozone levels were elevated, reaching 150 ppb, but because of the increased windspeed ozone concentrations remained below the Yellow Alert level.

4.6 CARBON MONOXIDE SUMMARIES

During 1977, excursions of the 8-hour primary standard of 9 ppm for carbon monoxide were recorded at four sites in Chicago and two sites in Granite City. All but one site, Chicago Daley Center, recorded more than one excursion and are in violation of the standard.

The highest number of excursions were recorded at two central business district (CBD) sites in Chicago: State Office Building with 74 excursions (73 violations) and CAMP Station with 30 excursions (29 violations). The State Office Building site was initiated in 1977, being established in late March, so that a complete year of data coverage was

not available. Compared to 1976 the CAMP Station recorded a factor of two increase in the number of excursions, from 16 to 30. The other Chicago site in violation, Sunnyside and Knox, recorded an increase in excursions from 2 in 1976 to 15 in 1977. The results from Granite City represent data from an instrument which was moved in August from 2301 Adams to a center-city traffic oriented location at 2001 Edison. Thus, the Edison site did not have a complete year of monitoring. The number of excursions was 1 (0 violations) at that location. Table 11 lists the dates, time periods, and maximum 8-hour averages for the excursions of the 8-hour carbon monoxide standard in 1977.

The highest 8-hour averages recorded in the state during the year were 16.0 and 14.6 ppm both recorded at the State Office Building in Chicago. Outside of Chicago, in Granite City the highest 8-hour average was 12.1 ppm.

There were no excursions of the 1-hour primary standard of 35 ppm. The highest 1-hour concentrations were 22.3 ppm at Medical Center, 22.1 ppm at State Office Building and 22 ppm at CAMP all in Chicago.

4.7 NON-METHANE HYDROCARBON SUMMARIES

Three monitoring stations in Illinois reported data for non-methane (reactive) hydrocarbons. The standard is a 6-9 a.m. (local time) average of 0.24 ppm not to be exceeded more than once a year. The standard is not health related but is designed to promote the achievement of the oxidant standard. In summarizing the data the number of 6-9 a.m. averages greater than 0.24 ppm were compared with the total number of valid 6-9 a.m. averages. The percent of days above the standard ranged from 41% at Springfield to 85% at the Medical Center in Chicago to 98% at Joliet. The highest 6-9 a.m. average was 3.9 ppm at the Medical Center in Chicago.

1977 STATEWIDE TOTAL SUSPENDED PARTICULATE RANKINGS

RANKING	SITE	ADDRESS	ANNUAL GEOMETRIC MEAN
1 2 3 4 5 6 6 8 9 10 11 11 13 14 14 16 17 17 17 17 17 22 23 23 23 25 26 26	Granite City Chicago: Washington High School Granite City! Granite City Chicago: Addams Elementary School Granite City Granite City HCCook Granite City Becatur HCCook Decatur Chicago: Cooley Vocational H. School Wood River Oglesby Bensenville Chicago: Anthony Elementary School Chicago: Hale Elementary School East Peoria Peoria Rockdale Hilan Peoria Granite City Cahokia State Park Chicago: Carver High School Chicago: Carver High School	2001 E. 20th 3500 E. 114th St. Norfolk & Western 15th & Madison 10810 S. Ave. "H" 23rd & Madison 23rd & Nameoki 50th St. & Glencoe 2000 Edison Roosevelt & Rock Rd. Jasper & Orchard Route 66 & Lawndale 22nd & Geddes 1225 N. Sedgwick 54 N. Walcott 217 Portland Main & York 9800 S. Torrence Ave. 6140 S. Melvina Ave. 235 E. Washington 2711 S.W. Jefferson Well #2 Pump Station 125 W. 2nd Ave. 610 N.E. Jefferson 2040 Johnson Ave. Business Rte. 40 801 E. 133rd Pl.	(UG/M3) 186 170 133 131 118 112 110 108 107 101 101 97 95 95 91 88 88 88 88 88 88
28 28 30 30 30 33 35 35 35 35 40 40 42	Chicago: Kelly High School Granite City Chicago: Austin West High School Joliet Joliet Chicago: Medical Center East Moline Alton Blue Island Chicago: GSA Building Chicago: South Water Filter Plant Summit Carbondale Chicago: Lindblom High School Cicero	4136 S. California 3201 E. 23rd 118 M. Central Joliet & Benton 501 Ella 1947 M. Polk 915 16th Ave. 103 E. 3rd St. 12700 Sacramento 538 S. Clark 3300 E. Cheltenham 60th & 7th Ave. 306 W. Main St. 6130 S. Wolcott 15th St. & 50th Ave.	81 81 80 80 80 79 78 78 78 78 78 77 77 77
43 45 46 46 49 49 49 53 55 55 55 57 57 59 60	Collinsville Rock Island (RASN) Bedford Park Chicago: Logan Square Decatur Bloomington Chicago: Fenger Jr. College Columbia Springfield Alton Elmhurst Bradley Chicago: Taft High School Chicago: Calumet High School Galena Decatur Harvey Calumet City Chicago: Kenwood High School	115 A. W. Main 1528 3rd Ave. 6535 S. Central 2960 W. Cortland Ave. 600 E. Garfield 301 W. Washington 11220 S. Wallace 208 S. Rapp 224 W. Adams 2708 Edwards 118 Schiller 610 E. Liberty 5625 N. Natoma 8131 S. May St. 8010 S. Kostner Ave. 311 S. Main St. 750 E. Lake Shore Dr. 157th & Lexington 755 Pulaski Rd. 5015 Blackstone	75 74 73 73 72 72 72 72 71 71 70 69 69 68 67 66 66
62 62 65 66 66 68 68	Chicago: Lakeview High School Chicago: Edgewater Bedford Park Moline Bensenville Lockport	4015 N. Ashland 5358 N. Ashland Ave. 6700 S. 78th Ave. 619 16th Ave. 375 Meyer 5th & Madison	66 65 64 64 63 63

TABLE 6 (CONT.) 1977 STATEWIDE TOTAL SUSPENDED PARTICULATE RANKINGS

RANKING SITÉ	ADDRESS	ANNUAL GEOMETRIC MEAN (UG/M³)
RANKING Arlington Heights Chicago: Steinmetz High School Mokena Maukegan Peoria T5 Parion Rock Falls Chicago: SunSteuben High School Franklin Park T7 Chicago: VonSteuben High School Franklin Park T7 Peoria Plainfield Wheaton DesPlaines B3 Galesburg B3 Rock Island B3 Romeoville Effinyham Hillside Quincy Ghampaign Chicago Heights Dekalb Echardsville Elgin Hennepin Monee Hiles Hiles West Chicago Flossmoor River Forest Rockford Or Ottawa Wilmington Chicago: Sullivan High School Moline Oak Park Walkegan Crystal Lake Rockford Joilet Mestec Lake Buff Evanston Lake Mest Chicago Island Lake Mest Chicago Island Rockford Crib Hillothian Palatine Park Forest Skokie Hiles Skokie Lake Buff Lake Rockford Joilet Ligin Rockford Crib Hillothian Rolling Rockford Crib Hillothian Rolling Rockford Lake Rockford Joilet Ligin Rockford Lake Rockford Rock Rockford Rock Rockford Rock Rock Rock Rock Rock Rock Ro	33 S. Arlington Heights Road 3030 N. Mobile Ave. 10940 Front St. 106 Utica 1604 Detweiller 2209 W. Main St. 101 12th Ave. 5039 N. Kimball Ave. 3400 N. Rose St. 601 N. 18th St. Bradley University 1005 Eastern 201 Ruber St. 1755 S. Wolf Rd. 1401 Marquette Main Street 911 Waukegan 175 Jackson 1400 25th Ave. Naperville Road 1015 S. Willow Wolf & Harrison 9th & Vermont 2125 S. First Dixie Highmay & 10th 200 S. 4th Main & Purcell 1002 N. Liberty 5th & High 432 E. Main St. 8955 Greenwood Ave. 128 W. McConnell 999 Kedzie Ave. Lathrop & Oak Avenues 126 S. 1st Street 7701 Lincoln 130 W. Army Trail Road 211 E. Main South Joliet St. 6631 N. Bosworth 3600 23rd Ave. 834 Lake Street 133rd & LaGrange 2200 Brookside 68th St. & Lake Michigan 15202 Crawford Ave. 1000 Quentin Rd. 100 Park Ave. 4401 Dempster DuPage County Airport Island Lake Grade School Golf & Jackson Franklin & Caroline 2525 Ohio 1216 Houbolt 9th St. & Central Ave. 1st Street & Three Oaks Road 121 E. Sheridan 1454 Elmwood 112 Willow	62 62 62 60 60 60 60 60 60 60 60 60 60 60 60 60

1977 TOTAL SUSPENDED PARTICULATE VALUES IN EXCESS OF THE 24-HOUR PRIMARY STANDARD OF 260 MICROGRAMS PER CUBIC METER

SITE	ADDRESS	DATE	VALUĖ (UG/M³)
67 METROPOLITAN CHICAGO INTERSTA	TE (ILL IND.)		
COOK COURTY			
Blue Istand	12700 Sacremento	April 15	282
Calumet City	755 Pulaski Road	May 31	264
Chīcago:			
Addams Elementary School *	10810 South Ävenue "H?	January 28 April 16 May 13 May 22 May 31 July 15 July 21 September 13	264 329 279 269 304 351 385 297 342
Anthony Elementary School	9800 South Torrence Avenue	May 22	313
Calumet High School	8131 South May Street	September 7	278
Carver High School *	801 East 133rd Place	May 19 May 22	285 292
Calumet High School Carver High School * Chicago Vocational High School *	2100 East 87th Street	January 28 May 22	282 281
Cooley Vocational High School	1225 North Sedyick	August 26	373
Fenger Jr. College ★	11220 South Wallace	January 28 May 22	291 2 <i>7</i> 7
Hale Elementary School *	6140 South Melvina Avenue	January 28 April 16 June 3	378 280 287
Kelly High School	4136 South California	July 9	374
Кепwood High School *	5015 Blackstone	January 28 April 4 May 22	300 261 309 288 261
Lindblöm High Séhool *	6130 South Holcott Avenue	January 28 July 15	ro,
S. Water Filtration Plant *	3300 E. Cheltenham	March 26 May 22 June 3	269 319 405
Stevenson Elementary School *	8010 South Kostner Avenue	January 28 May 22	429 265
Taft High School	5625 North Natoma	August 29	276
S. Water Filtration Plant * Stevenson Elementary School * Taft High School Washington High School *	3500 East 114th Street	January 16 January 28 January 31 February 3 April 16 May 10 May 13 May 16 May 16 May 19 May 22 May 31 July 6	269 319 405 429 265 276 325 472 494 306 347 617 427 309 412 339 515 281

^{*} This site is in violation of the 24-hour Primary Air Quality Standard.

TABLE 7 (CONT.)

TOTAL SUSPENDED PARTICULATE VALUES IN EXCESS OF THE 24-HOUR PRIMARY STANDARD OF 260 MICROGRAMS PER CUBIC METER

SITE	ADDRESS	DATE	VALUE (UG/M³)	
Washington High School * (Cont.)	3500 East 114th Street	July 12 October 13 October 31 November 6 November 12 November 18 December 9	284 265 688 447 601 1106 364	
<u>DuPAGE COUNTY</u> Bensenville	Main and York	Mary 12	267	
	rain and tork	Мау 13	267	
<u>KANKAKEE COUNTY</u> Bradley	610 East Liberty	May 31	281	
WILL COUNTY	F Face No. Builde			
Joliet Rockdale	5 East Van Buren Well #2 Pump Station	May 13 April 1	368 262	
NVCRUSTC		APP II I	202	
68 METROPOLITAN DUBUQUE INTERSTA	TE (ILL WIS IOWA)			
JODAVIESS COUNTY				
Galena	311 South Main Street	September 12	376	
Joliet Rockdale 68 METROPOLITAN DUBUQUE INTERSTA JODAVIESS COUNTY Galena 69 METROPOLITAN QUAD CITIES INTER ROCK ISLAND COUNTY Milan Moline	RSTATE (ILL IOWA)	e .		
ROCK ISLAND COUNTY				
Milan	125 West 2nd Avenue	May 31	300	
Moline	619 16th Avenue	May 1	330	
70 METROPOLITAN ST. LOUIS INTERS	TATE (ILL MO.)			
MADISON COUNTY				
Granite City *	23rd and Madison	March 2 March 8 March 26	385 276 270	
Granite City	3201 East 23rd	May 13	302	
Granite City Granite City Granite City *	2001 East 20th	January 31 February 18 February 24 March 8 March 14 May 13 May 31 June 30 July 6 July 18 August 5 September 16 September 22 November 9 November 21	385 276 270 302 295 329 406 485 310 328 272 469 328 292 310 280 272 417 478 592	

^{*} This site is in violation of the 24-hour Primary Air Quality Standard.

TABLE 7 (CONT.) 1977

TOTAL SUSPENDED PARTICULATE VALUES IN EXCESS OF THE 24-HOUR PRIMARY STANDARD OF 260 MICROGRAMS PER CUBIC METER

ADDRESS	DATE	VALUE (UG/M³)	
15th and Hadison February 18		265 323	
Roosevelt and Rock Road	March 8	323 274	
Norfolk and Western	Norfolk and Western January 31 February 15 February 18 May 25 June 18		
23rd and Nameoki	December 6		
54 North Walcott	July 18 July 24	372 437	
7 Callinguille Augeur	May 10	361	
	may 19	361	
TATE			
7401 Marquette	Mey 31	267	
217 Pörtland	January 23 February 2 February 8 February 16 February 21 March 8 April 16 June 2 July 3 October 4 December 29	396 357 311 280 430 334 355 333 412 278 395	
230 Portland	July 3 July 18 October 4 December 29	517 328 325 443	
Maple and Watson	August 28	270	
, - кү.)			
Massac County Hospital	June 8	350	
	15th and Madison Roosevelt and Rock Road Norfolk and Western 23rd and Nameoki 54 North Walcott 7 Collinsville Avenue TATE 7401 Marquette 217 Portland 230 Portland Haple and Watson - KY.)	15th and Madison Roosevelt and Rock Road Norfolk and Western January 31 February 15 February 15 February 18 May 25 June 18 December 6 23rd and Nameoki April 28 May 4 May 13 May 16 August 5 54 North Walcott July 18 July 24 7 Collinsville Avenue May 19 TATE 7401 Marquette May 31 217 Portland January 23 February 2 February 2 February 2 February 16 February 21 March 8 April 16 June 2 July 3 October 4 December 29 230 Portland Jally 18 October 4 December 29 Maple and Wetson August 28	

^{*}This site is in violation of the 24-hour Primary Air Quality Standard.

Special Purpose Site

TABLE 7 (CONT.) 1977 TOTAL SUSPENDED PARTICULATE VALUES IN EXCESS OF THE 24-HOUR PRIMARY STANDARD OF 260 MICROGRAMS PER CUBIC METER

SITE	ADDRESS DATE		VALUE (ug/m³)	
73 ROCKFORD-JANESVILLE-BELDIT IN	TERSTATE (ILL WIS.)			
<u>DeKALB COUNTY</u> DeKalb	200 South 4th	May 13	435	
75 WEST CENTRAL ILLINOIS INTRASTATE				
MACON COUNTY Decatur	22nd and Geddes	March 8	285	
Decatur *	Jasper and Orchard	March 2 March 14 March 26 April 1	276 293 288 262	

^{*}This site is in violation of the 24-hour Primary Air Quality Standard.

TABLE 8

1977 STATEWIDE SULFUR DIOXIDE RANKINGS

RANKING	SITE	ADDRESS	ANNUAL ARITHMETIC MEAN (PPM)	
	Primary Standard		.030	
1 2 3 3 3 7 7 7 9 9 11 1 13 15 5 15 19 9 19 19 19 19 19 19 19 19 19 19 22 22 22 28 20 30 30 36 41 1 41 45 55 56 66 62 62 62 62 62 62 62 62 62 62 62 62	Wood River Granite City Calumet City Chicago Heights Hillside Peoria Alton Chicago G.S.A. Building East St. Louis Pekin Chicago: (CAMP) Peoria Bedford Park Springfield Cahokia Chicago: Kenwood High School Marion McCook Chicago: Addams Elementary School Chicago: Cooley Vocational High School Chicago: Hale Elementary School Chicago: Lakeview High School Chicago: Lakeview High School Chicago: Steinmetz High School Chicago: Steinmetz High School Chicago: Steinmetz High School Chicago: Crib Chicago: Crib Chicago: Crib Chicago: Carver High School Chicago: Sullivan High School Chicago: Edgewater Chicago: Carver High School Chicago: Edgewater Chicago: Fenger Jr. College Chicago: Fenger Jr. College Chicago: Taft High School Chicago: Taft High School Chicago: Taft High School Chicago: Taft High School Chicago: Stevenson Elementary School Peoria Quincy Naukegan Chicago: South Water Filtration Plant Bedford Park Champaign Chicago: South Water Filtration Plant Bedford Park Champaign Chicago: Calumet High School Decatur East Moline	54 N. Walcott 2301 Adams 755 Pulaski Dixie Highway & 10th Wolf & Harrison Hurlburt & McArthur 2708 Edwards 538 S. Clark 650 Missouri 272 Derby 445 Plymouth 407 N.E. Adams 6535 S. Central 712 S. Dirksen Business Rte. 40 5015 Blackstone 2209 W. Main 50th St. & Glencoe 10810 S. Ave. "H" 1225 N. Sedwick 6140 S. Melvina 2760 N. 22nd St. 1947 W. Polk 1167 W. Washington 2000 Edison 419 Fulton Golf & Jackston 4015 N. Ashland 1528 18th Ave. 118 N. Central 2100 E. 87th St. 3030 N. Mobile 3500 E. 114th St. 9800 Lawler 224 W. Adams 306 W. Main 68th St. & Lake Michigan 6631 N. Bosworth 541 Chartres 9th & Vermont 9800 S. Torrence 801 E. 133rd Pl. 161 S. Cherry Joliet & Benton 375 Meyer 12700 Sacramento 5358 N. Ashland 11220 S. Wallace 6130 S. Walcott 5625 N. Natoma 15th St. & 50th Ave. Route 29 834 Lake St. 1604 Detweiller 60th & 74th Ave. 4136 S. California 8010 S. Kostner 2711 S.M. Jefferson 18th & Elm 3010 Grand Ave. 4136 S. California 8010 S. Kostner 2711 S.M. Jefferson 18th & Elm 300 E. Cheltenham 6700 S. 78th 2125 S. First 8131 S. May Franklin & Wood 915 16th Ave.	.030 .025 .023 .02 .02 .020 .019 .019 .018 .018 .017 .017 .016 .016 .014 .014 .014 .013 .013 .013 .013 .013 .013 .010 .010	

Special Purpose Site

TABLE 8 (CONT.) 1977 STATEWIDE SULFUR DIOXIDE RANKINGS

RANKING	SITE	ADDRESS	ANNUAL ARITHMETIC MEAN (PPM)	
62 62 62 62 62 62 72 72 72	Flossmoor Galena Harvey Ottawa Wilmette Des Plaines Morton Grove Park Forest	999 Kedzie 311 S. Main St. 157th & Lexington 211 E. Main 9th St. & Central Ave. 1755 S. Wolf 9111 Waukegan 100 Park Ave.	.004 .004 .004 .004 .004 .003 .003	

1977 SULFUR DIOXIDE IN EXCESS OF THE PRIMARY (24-HOUR) AND SECONDARY (3-HOUR) SHORT TERM STANDARDS*

STATION	ADDRESS	DATE	AVERAGING TIME	NUMBER*	TIME PERIOD	MAXIMUM AVERAGE (PPM)
65 BURLINGTON-KEOKUK IN	TERSTATE (ILL, - IND.)		·			
<u>PEORIA COUNTY</u> Peoria	Glen Oak Park	December 12-13	24 hour	1	1300-1700	.149
<u>TAZEWELL COUNTY</u> Pekin ^a	272 Derby	January 28-30 November 9-10	24 hour 24 hour	1 1	0809-0700 0100-1700	.228 .177
67 METROPOLITAN CHICAGO	INTERSTATE (ILL IND.)		·			e de la companya de l
COOK COUNTY						The state of the s
Blue Island	12700 Sacramento	March 8	24 hour	1	0000-2400	.158
Calumet City	755 Pulaski	April 15-16	24 hour	1	0400-0400	.15
Chicago:		·				
Camp	445 Plymouth	February 8-10	24 hour	1	2200-0300	.142
70 METROPOLITAN ST. LOU	70 METROPOLITAN ST. LOUIS INTERSTATE (ILL MO.)					i i
MADISON COUNTY						
Wood River	54 N. Walcott	February 7-9	24 hour	1	0800-0500	.194

^{*}The 24-Hour Primary Standard is 0.14 parts per million; the 3-Hour Secondary Standard is 0.50 parts per million

The 44-Mour Primary Standard is 4.14 peris per million, 1.15 5 1.15 This site is in violation of the 24-hour Primary Air Quality Standard.

Phon-overlapping averages greater than the Standard.

TABLE 10

1977 STATEWIDE NITROGEN DIOXIDE RANKINGS

RANKING	SITE	ADDRESS	ANNUAL ARITHMETIC MEAN (PPM)
RANKING 1 2 3 3 5 6 7 7 9 9 11 12 12 12 15 18 18 18 18 18 18 18 18 21 21 21 25 27 27 20 30 30 30 30 30 30 30 30 30 30 30 30 30	Primary Standard— Chicago: G.S.A. Building Chicago: CAMP Chicago: Austin West High School Skokie Cicero Oak Park Chicago: Cooley Vocational High School Morton Grove Chicago: Lakeview High School Summit Chicago: Kelly High School Chicago: Edgewater Harvey Hillside Chicago: Lindblom High School Chicago: Medical Center Des Plaines Blue Island Chicago: Kenwood High School Chicago: Steinmetz High School Chicago: Steinmetz High School Chicago: Anthony Elementary School Chicago: Anthony Elementary School Chicago: Calumet High School Chicago: Calumet High School Chicago: Calumet High School Chicago: Carver High School Chicago: Carver High School Chicago: Washington High School Wilmette Chicago: Washington High School Wilmette Chicago: Sullivan High School Joliet Park Forest Chicago: Sullivan High School Granite City Chicago: Stevenson Elementary School Granite City Chicago: South Water Filtration Plant East St. Louis Chicago: South Water Filtration Plant East St. Louis Chicago: Fenger Junior College East Moline Bensenville Waukegan Peoria Decatur Henry Rockford Galesburg Peoria Decatur Henry Rockford Galesburg Peoria Carbondale LaSalle Champaign Marion Quincy Ottawa	538 South Clark 445 Plymouth 118 North Central 9800 Lawler 15th Street and 50th Avenue 834 Lake Street 1225 North Sedywick 9111 Waukegan 4015 North Ashland 60th and 74th Avenue 4136 South California 5358 North Ashland 157th and Lexington Wolf Road and Harrison 6130 South Wolcott 1947 West Polk 1755 South Wolf Road 12700 Sacramento 5015 Blackstone 3030 North Mobile 10810 South Avenue "H" 9800 South Torrence 2100 East 87th Street 6140 South Melvina 8131 South May 5625 North Natoma 801 East 133rd Place 3500 East 114th Street 94th Street and Central Avenue plxie Highway and 10th Street 999 Kedzie 755 Pulaski 6631 North Bosworth Joliet and Benton 100 Park Avenue 68th Street and Lake Michigan 8010 South Kostner 2000 Edison 3300 East Cheltenham 650 Missouri 11220 South Wallace 915 16th Avenue 419 Fulton 54 North Walcott 1604 Detweiller 224 West Adams 1167 West Mashington Franklin and Wood Route 29 1528 18th Avenue 161 South Cherry 2711 S. W. Jefferson 306 West Main 18th and Elm 211 East Main	

1977 CARBON MONOXIDE IN EXCESS OF THE 8-HOUR PRIMARY STANDARD OF 9 PARTS PER MILLION

SITE	ADDRESS	DATE	TIMÉ PERIOD	NUMBER OF 8-HOUR AVERAGES >9 PPM	MAXIMUM 8-HOUR AVERAGE (PPM)
67 METROPOLITAN CHICAGO	INTERSTATE (ILL IND.)	in the second second		
<u>COOK COUNTY</u> Chicago:					
CAMP◆	445 Plymouth	February 22 April 15-16 Hay 2 May 3 May 4 May 14 May 20 May 25 May 26 May 27 June 5-6 June 17 June 24 June 27 July 7 July 11 July 13 August 6-7 September 7 September 7 September 7 September 30 October 28 Hovember 7 November 29 December 13 December 30 February 7	7900-2400 1500-0500 7500-2100 1200-2100 1200-2100 1000-1900 7600-1900 1100-2100 1100-2100 1000-2300 1500-2400 0400-1500 0900-2300 1100-2200 1400-0300 0700-2200 1400-0300 0700-2200 1500-1700 0500-1700 0500-1700 1100-2100 1100-1900	1 2 1 1 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	11 10 10 10 10 10 10 10 10 10 10 10 10 1
State Office Building	160 North LaSalle	April 1 April 18 April 18 April 29 tlay 2 tlay 4 tlay 5 tlay 16 tlay 17 tlay 19 tlay 20 tlay 23 tlay 24 tlay 25 June 6 June 10 June 17 June 24 June 27 June 28 June 30 July 6 July 7 July 8 July 11 July 12 July 12 July 12 July 12 July 12 July 13 July 12 July 13 July 14 July 15 July 15 July 19	1000-1800 1000-1800 1000-2000 1300-1500 1700-1700 1600-1900 1600-1900 1600-1900 1600-1500 1700-1500 1700-1700 1700-1700 1700-1700 1700-1700 1700-1800		9.3 11.8 10.4 9.8 11.0 10.2 11.7 10.2 12.4 11.6 9.5 10.5 13.8 10.5 13.8 10.5 11.4 11.1 12.4 11.1 12.4 11.1 12.7

^{*}These are non-overlapping 8-hour averages

⁺This site is in violation of the 8-hour Primary Air Quality Standard

TABLE 11 (CONT.)

1977

CARBON MONOXIDE IN EXCESS OF THE 8-HOUR PRIMARY STANDARD OF 9 PARTS PER MILLION

SITE	ADDRESS	DATE	TIME PERIOD	NUMBER OF 8-HOUR AVERAGES >9 PPM*	MAXIMUM 8-HOUR AVERAGE (PPM)
State Office Building* (Cont.) Sunnyside and Knox*	160 North LaSalle	July 28 July 29 August 3 August 8 August 9 August 10 August 22 August 24 August 26 August 30 September 1 September 7 September 7 September 13 September 16 September 20 September 20 September 21 September 22 September 29 September 30 October 19 October 19 October 28 November 3 November 3 November 3 November 3 November 3 November 14 November 3 November 14 November 29 November 30 December 13 December 29 December 29 December 30	9500-1900 0500-2100 0500-2100 0500-2100 0500-2100 0500-1900 0600-1900 0500-2100 0900-1800 0900-2100 0900-2100 0500-2200 0900-2100 0500-1900 0500-1900 0500-1900 0500-1900 0500-1900 0500-2000 0500-1900 0500-2000	1 2 1 2 1 1 1 1 1 1	11.4 12.1 13.4 13.4 13.6 10.8 9.3 10.6 10.3 11.8 10.4 11.5 11.7 10.4 10.5 9.7 13.0 10.1 9.8 10.1 9.8 10.1 9.8 10.3 10.6
Sunnyside and Knox⇒	4632 West Sumnyside	February 25-26 March 14-15 March 14-15 March 15-16 March 17-18 April 5 April 15-16 April 21 August 29-30	0500-0800 1200-0200 2300-1000 1500-1600 0000-1200 0400-1900 1900-0800 1100-2200 2300-0800	3 1 0 3 4 1 1 1	14.5 10.3 16.0 9.5 9.3 9.8 11.9 10.5 9.9 9.2 12.8 10.9 9.3 10.5 9.7
70 METROPOLITAN ST. LOU	IS INTERSTATE (ILL MO	.)			
MADISON COUNTY		·			
Granite City	2001 Edison	October 13	0300-1400		9.4

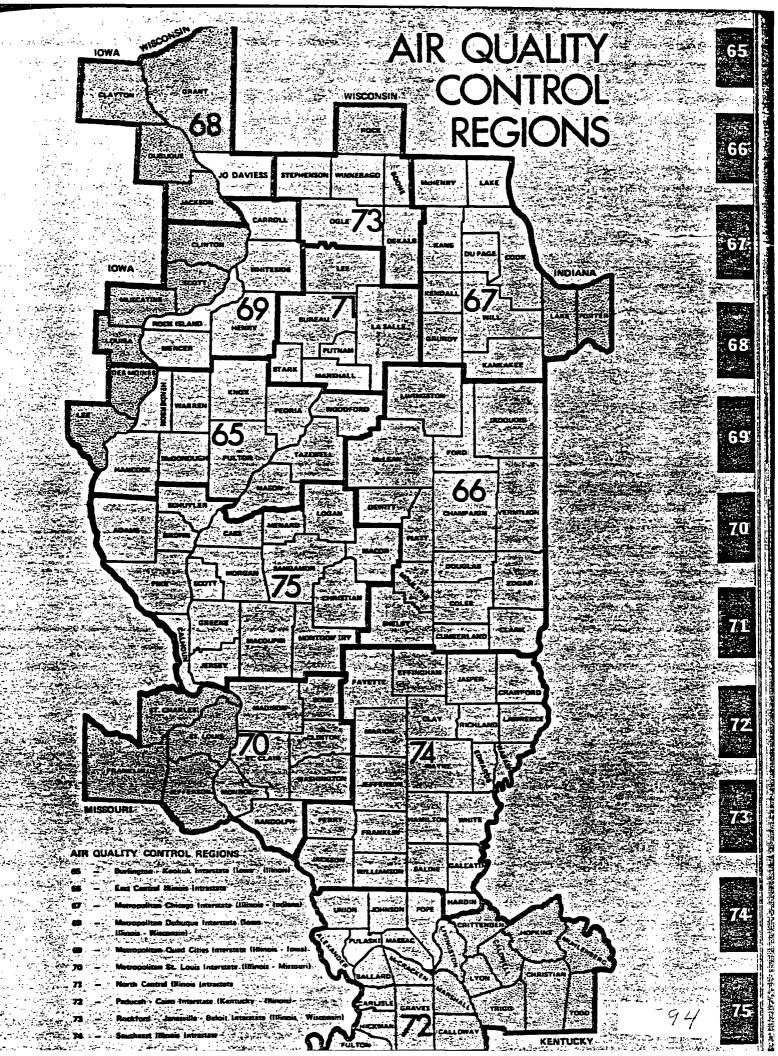
^{*}These are non-overlapping 8-hour averages.

1592

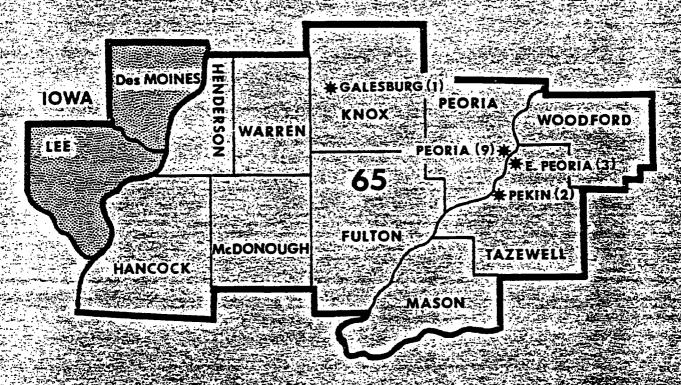
^{*}This site is in violation of the 8-hour Primary Air Quality Standard.

5.0

1977 REGIONAL AIR QUALITY DATA



AIR QUALITY CONTROL REGION 65 BURLINGTON - KEOKUK INTERSTATE (IOWA-ILLINOIS)



Data for the lowa portion of this control region can be obtained from
Towa Department of Environmental Quality:
3920 Delaware Avenue:
P. 0. 8ox 3326.
Des Moines Iowa 50316

(515) 265-8134

(The number of sampling sites in each city is shown in parenthesis following the city name.)

BURLINGTON-KEOKUK INTERSTATE (IOWA-ILLINOIS) AIR QUALITY CONTROL REGION (AQCR) 65

TOTAL SUSPENDED PARTICULATES

Three sites out of the six recording valid annual averages for 1977 were in violation of the annual primary standard. The maximum annual average was 88 ug/\bar{m}^3 measured at 2711 S. W. Jefferson in Peoria and at 235 East Washington in East Peoria. Of the sites in excess of the annual standard, none are showing downward trends; however, the means for all three sites were lower in 1977 than in 1976. Figure 2 is a map of the Peoria area listing the 1977 geometric mean for each site recording a valid average.

There were no excursions of the 24-hour primary standard recorded at any of the monitoring sites in AQCR 65 during 1977. This compares with 10 excursions recorded in the Region in 1976.

SULFUR DIOXIDE

None of the sites in this Region recorded annual averages in excess of the primary annual standard of .03 ppm; the highest annual average was .020 ppm recorded at Hurlburt and MacArthur in Peoria. Figure 3 is a map of the Peoria area listing the annual arithmetic means for those sites having valid averages. Two sites, Pekin and Glen Oak Park in Peoria, recorded excursions of the 24-hour primary standard of .14 ppm. Peoria-Glen Oak Park recorded only one excursion and, therefore, is not in violation of the standard; Pekin recorded two excursions and as such is in violation of the 24-hour standard. The highest 24-hour average was .228 ppm recorded in Pekin. There were no recorded excursions of the 3-hour secondary standard by any of the sites listed. However, one excursion of the 3-hour standard was recorded by an industrial monitor (see Section 6.0).

NITROGEN DIOXIDE

None of the five sites recording valid annual averages were in excess of the primary annual standard of .05 ppm. The highest annual average was .025 ppm which is only 50% of the standard.

<u>OZONE</u>

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The only site monitoring ozone in AQCR 65, Hurlburt and MacArthur in Peoria, recorded 77 excursions of the 1-hour primary standard of .08 ppm during 1977. Approximately two thirds of these excursions occurred during the month of May. The highest 1-hour average recorded was .126 ppm.

CARBON MONOXIDE

The Peoria site located at 407 N. E. Adams did not record any excursions of either the 8-hour or 1-hour primary standards. The highest 8-hour average was 8.1 ppm and the highest 1-hour average was 18.1 ppm. In 1976 two excursions of the 8-hour standard were recorded at this site.

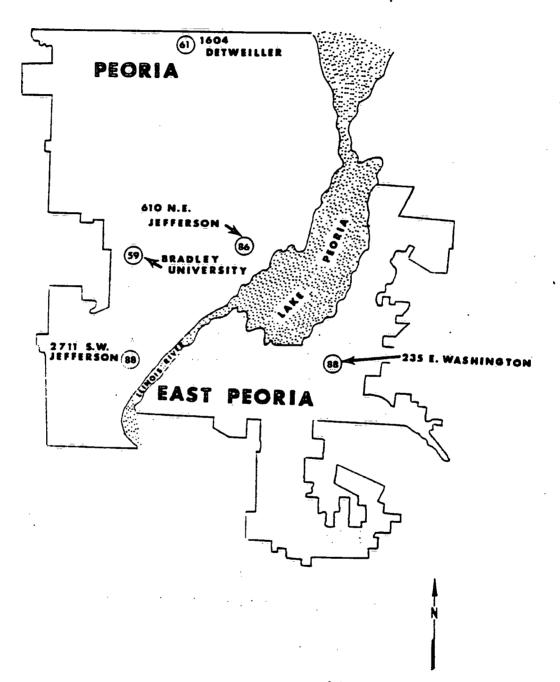
NON-METHANE HYDROCARBONS

Data not available for Illinois portion of this air quality control region.

PEORIA AREA

TOTAL SUSPENDED PARTICULATES ANNUAL GEOMETRIC MEAN

(MICROGRAMS PER CUBIC METER)



1 inch equals approximately 2.2 miles

FIGURE 2

PEORIA AREA

SULFUR DIOXIDE ANNUAL ARITHMETIC MEAN

(PARTS PER MILLION)

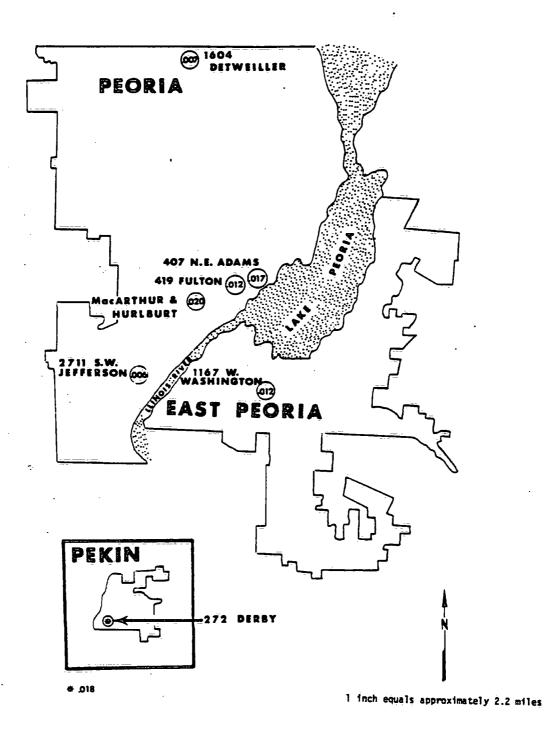


FIGURE 3

1977 TOTAL SUSPENDED PARTICULATES

(MICROGRAMS PER CUBIC METER)

STATION	ADDRESS	NUMBER OF SAMPLES			HIGHEST SAMPLES				ANNUAL STATISTICS		
		TÖŤAL	>150 UG/M3	>260 UG/M ³	.	2 nd	3rd	4th	GEOMETRIC MEAN	STO GEO. DEVIATION	
KNOX COUNTY Galesburg PEORIA COUNTY	Main Street	50	2	0	249	196	134	124	58	1.77	
Peoria Peoria (RASN) Peoria Peoria Peoria Peoria	610 N. E. Jefferson 610 N. E. Jefferson 2711 S. W. Jefferson 1604 Detweiller Bradley University	58 7 57 58 53	4 6 1	00000	199 152 226 173 205	193 80 178 135 147	172 76 171 124 115	161 69 165 113 112	86 * 88 61 59	1.50 1.61 1.60 1.68	
<u>TAZEWELL COUNTY</u> East Peorla Pekin	235 East Washington 531 Court	52 27	4	00	190 149	169 128	165 121	151 120	88	1.43	

SHORT-TERM TRENDS FOR TOTAL SUSPENDED PARTICULATES

o Ē A Ē I O N	ADDRESS	ANNUAL MEAN (ug/m³)										
STATION	ADDRESS	1971	1972	1973	1974	1975	1976	1977				
KNOX COUNTY	·											
Galesburg	Main Street	-	71	66	67	. 73	67	58				
PEORIA COUNTY			í									
Peoria Peoria	610 N.E. Jefferson 2711 S.W. Jefferson	107 91	78 75	82 74	71 69	91 90	98 90	86 88				
Peoria Peoria	1604 Detweiller Bradley University	-	-	57	71 69 61 54	58 70	98 - 90 66 65	86 88 61 59				
TÁTELIEL CALAITÝ				_								
TAZEWELL COUNTY East Peoria	235 East Washington		95	70	84	95	96	88				
Pekin	531 Court	93		*	84 85	95 77	96 81					

⁼ Site not in operation during year shown.

Did not meet minimum statistical culting criteria (see section 4.1)

1977 SULFUR DIOXIDE

(PARTS PER MILLION)

STATION	ADDRESS	NUMBER OF SAMPLES				HIGHEST SAMPLES (PPM)				ANNUAL STATISTICS		
				3 - HR AVGS >.5	24-HR AVGS	3-HF	. AVG.	24-HI	AVG.	ARITH.	STD. GEO.	
2	<u> </u>	1 HR	24 HR	>.5	>.14	1 st	2nd	lst	2nd	MEAN	DEVIATION	
KNOX COUNTY Galesburg PEORIA COUNTY Peoria (RASN) Peoria	161 South Cherry 610 N. E. Jefferson 2711 S. W. Jefferson Hurlburt and MacArthur 1604 Detwelller 407 N. E. Adams 419 Fulton Glen Oak Park	7550 7111 1344	54 51	NA NA O NA O NA O	0 0000001	NA NA NA .450 NA .212 NA .190	NA NA NA .298 NA .178 NA .184	.052 .043 .028 .124 .048 .085 .062	.027 .016 .027 .110 .030 .070 .042	.008 * .006 .020 .007 .017	2.60 2.34 2.62 2.51 2.58 2.81	
TAZEWELL COUNTY East Peoria East Peoria Pekin	801 Springfield Road 1167 West Washington 272 De rb y	1801 7067	55	O NA O	0 0 2	.154 NA .464	.154 NA .403	.038 .111 .228	.037 .090 .177	.012 .018	3.03 2.53	

NITROGEN DIOXIDE

(PARTS PER MILLION)

STATION	ADDRESS	NO. SAM	OF PLES		QUART VERAGE:	ERLY S(PPM)		ANNUAL STATISTICS		
3121101	, , , , , , , , , , , , , , , , , , ,	1 HR	24 HR	lst	2nd	3rd	·4th	ARITH. MEAN	STD. GEQ. DEVIATION	
KNOX COUNTY Galesburg PEORIA COUNTY	161 South Cherry		36	.019	.016	.014	.025	.018	1.54	
Peoria (RASN) Peoria Peoria Peoria Peoria Peoria	610 N. E. Jefferson 2711 S. W. Jefferson 1604 Detweiller 407 N. E. Adams 419 Fulton	2572	6 53 54 52	.025 .019 .036 *	.018 .017 .026	.012 .016 .023	.018 .024 .018 .026	.017 .023 .025	1.67 1.82 1.33	
TAZEWELL COUNTY East Peoria	1167 West Washington		55	.022	.020	.020	.021	.021	1.47	

NA - Not applicable

1321

 ⁻ Did not meet minimum statistical culling criteria (see section 4.1).

1977 OZONE (PARTS PER MILLION)

		NO. SAMI	OF PLES	HIGHEST SAMPLES (PPM)												
STATION	ADDRESS	ADDRESS		. 2		>.08									ANN	UAL
		TOTAL PPM		MAR	APR	APR MAY		INNE INTA		SEPT	OCT	lst	2nd			
PEORIA COUNTY																
Peoria	Hurlburt & MacArthur	5843	77	ทร	.078	. 125	.126	.099	.085	.072	.045	.126	.126			
1 33.72						(51)	(14)	.099 (11)	(1)							

Numbers shown in parenthesis denote the number of samples exceeding .08 ppm in a given month.

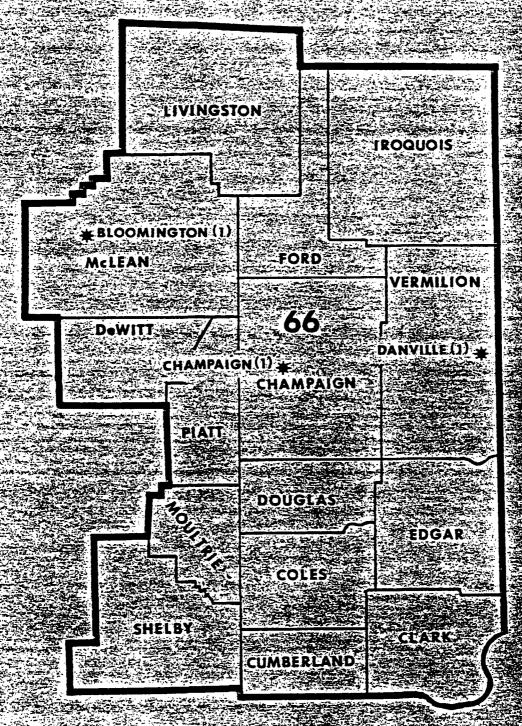
CARBON MONOXIDE

(PARTS PER MILLION)

		NO OF	NUMBER OF	AVERAGES	HIGHEST						
STATION	ADDRESS	SAMPLES	1 - HR	8 - HR	1-HR AVERAGE			8-HR AVERAGE			
			>35 PPM	> 9 PPM	1 st	2nd	3 rd	lst	2 nd	3rd	
PEORIA COUNTY											
Peorta	407 N. E. Adams	6706	0	0	18.1	12.9	11.3	8.1	7.7	7.3	

NS - No samples

AIR QUALITY CONTROL REGION 66



(The number of sampling sites in each city is shown in parenthesis following the city name.)

EAST CENTRAL ILLINOIS INTRASTATE AIR QUALITY CONTROL REGION (AQCR) 66

TOTAL SUSPENDED PARTICULATES

Both sites in AQCR 66, Champaign and Bloomington, recorded annual geometric means below the primary annual standard in 1977. Bloomington had the highest average with 72 μ m³. Neither site recorded any 24-hour averages in excess of the 24-hour primary standard. The Bloomington site recorded the highest 24-hour sample in this Region with a value of 212 μ m³.

SULFUR DIOXIDE

Only one site, Champaign, had a sufficient number and distribution of samples to have a valid arithmetic mean. The annual average was .004 ppm, well below the annual standard of .03 ppm. The highest 24-hour sample, .021 ppm, was recorded in Champaign.

NITROGEN DIOXIDE

The only site with a valid annual average, Champaign, recorded an annual average of .015 ppm, well below the annual standard of .05 ppm.

OZONE

The monitoring site in Champaign recorded 107 excursions of the 1-hour primary standard of .08 ppm. Since the monitoring site was established late in the 1976 ozone season, a comparison between 1976 and 1977 cannot be made. More than 80% of the total number of excursions were recorded in May and July. The highest 1-hour average was .106 ppm.

CARBON MONOXIDE, NON-METHANE HYDROCARBONS

Data not available for this air quality control region.

THE PERSON OF TH

1977 TOTAL SUSPENDED PARTICULATES

(MICROGRAMS PER CUBIC METER)

STATION	ADDRESS	N L		HIGI SAM	HEST		ANNUAL STATISTICS			
		TOTAL	>150 UG/M ³			2 nd	3rd	- 4 th	GEOMETRIC MEAN	STD GEO. DEVIATION
CHAMPAIGN COUNTY		, -··		, and the second						
Champaign	2125 South First	51	1	ġ	157	137	132	129	56	1.61
MELEAN COUNTY										
Bloomington	301 West Washington	50	2	0	212	184	146	138	72	1,55

SHORT-TERM TRENDS FOR TOTAL SUSPENDED PARTICULATES

	ADDRESS		ANNUAL MEAN (UG/M³)										
STATION	AUUKESS	1971	1972	1973	1974	1975	1976	1977					
CHAMPAIGN COUNTY													
Champaign McLEAN COUNTY	2125 South First	-	-	•	-	46	56	56					
Bloomington	301 West Washington	84	96	53	58	64	75	72					

a Site ant in operation during year shows.

1977 SULFUR DIOXIDE

(PARTS PER MILLION)

		NUMBER OF SAMPLES				HIGH MPLE	(EST		ANNUAL STATISTICS	
	1 HR			24-HR AVGS >.14		المحتور		AVG.	ARITH, MEAN	STD. GEO. DEVIATION
2125 South First		51	NA .	0	NA	NA	.021	.013	.004	1.90
301 West Washington	.	44	NA.	0	NA	NA	.013	.013	•	
4 North Vermillion		27	NA I	0	NA -	NA .	.010	.007		
	ADDRESS 2125 South First 301 West Washington	ADDRÉSS 1 HR 2125 South First 301 West Washington	ADDRESS 1 HR 24 HR 2125 South First 51 301 West Washington 44	ADDRESS NUMBER OF SAMPLES 3 - HR AVGS > 5 2125 South First 51 NA 301 West Washington 44 NA	ADDRÉSS NUMBER OF SAMPLES 1 HR 24 HR AVGS AVGS AVGS AVGS AVGS AVGS AVGS AVGS	ADDRESS NUMBER OF SAMPLES SAMPL	ADDRÉSS NUMBER OF SAMPLE SAMPLES SAMPLE 1 HR 24 HR AVGS AVGS SAVGS SAV	ADDRÉSS NUMBER OF SAMPLES	ADDRESS NUMBER OF SAMPLES (PPM) 1 HR 24 HR AVGS AVGS AVGS AVGS AVGS AVGS AVGS AVGS	ADDRESS NUMBER OF SAMPLES SAMPLES (PPM) STATIS

NITROGEN DIOXIDE

STATION	ADDRESS	NO. SAM	OF I		QUART AVERAGE	S (PPM)	ANNUAL STATISTICS			
			24 HR	lst	2nd	3rd	4th	ARITH. MEAN	STD. GEO. DEVIATION	
CHAMPAIGN COUNTY										
Champaign	2125 South First Street		54	.017	.015	.014	.014	.015	1.78	
McLEAN COUNTY	·									
Bloomington	301 West Washington		44	.022	. 021	.022	*			
<u>VERMILION COUNTY</u>						i	!			
Danville	4 North Vermilion		27	.015	.014	.022	*	*		

OZONE

(PARTS PER MILLION)

		NO. SAME	OF LES			ولمند برد.	Н	IGHES	T SAN	APLES	(PPM)	
STATION	ADDRESS	TOTAL	> .08 PPM	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	lst	IUAL 2nd
CHAMPAIGH COUNTY					-								
Champaign 1	509 South Neil St.	3049	107	NŞ	чs	.10 6 (45)	.102 (17)	103 (45)	.072	.061	.040		.103

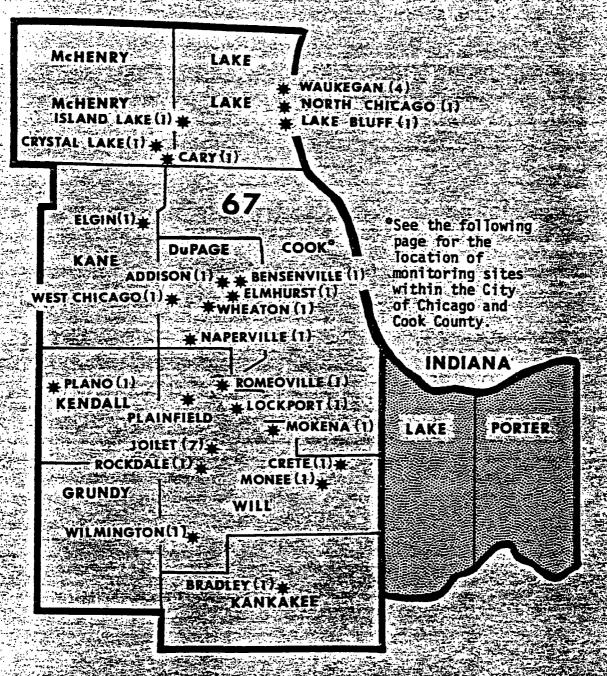
Not applicable

Did not meet-minimum statistical culling criteria (see section 4.1).

Numbers shown in parenthesis denote the number of samples exceeding .08 ppm in a given month.

1 Special Purpose Site

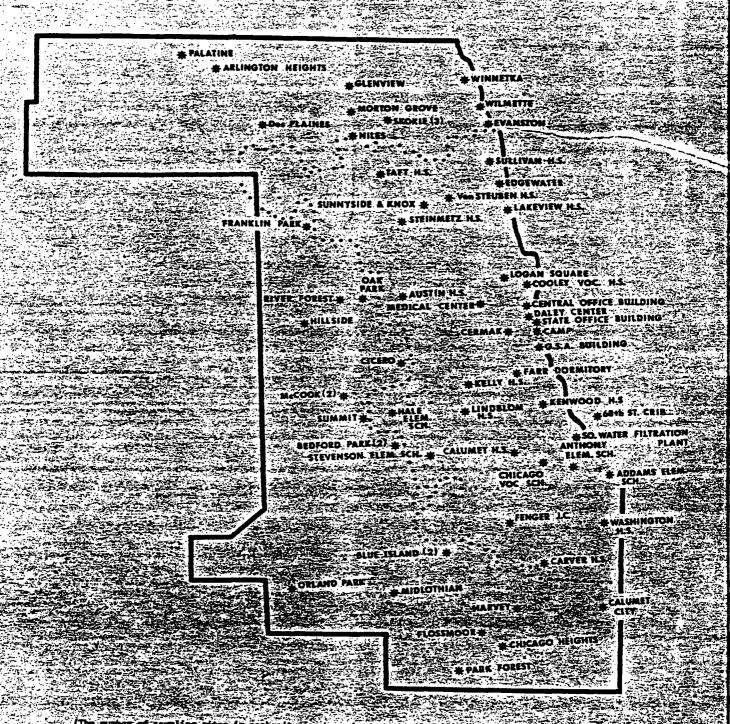
AIR QUALITY CONTROL REGION 67 METRO CHICAGO INTERSTATE (ILLINOIS-INDIANA)



Data for the Indiana portion of this control region can be obtained from:
Indiana Environmental Protection Agency,
Division of Air Pollution Control,
1330 West Michigan Street,
Indianapolis, Indiana 46206
(317) 633-0600

(The number of sampling sites in each city is shown in parenthesis following the city name.)

COOK COUNTY AND INCLUDING CHICAGO



(The number of sampling sites in each city is shown in parenthesis following the city name.)

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METROPOLITAN CHICAGO INTERSTATE (ILLINOIS-INDIANA) AIR QUALITY CONTROL REGION (AQCR) 67

TOTAL SUSPENDED PARTICULATES

A total of 80 sites in AQCR 67 recorded sufficient data for the computation of valid annual averages. Of these 80 sites, 21 (26%) had geometric means in excess of the primary annual standard. On a percentage basis this represents a 6% drop from 1976. In the City of Chicago 12 out of 25 sites (48%) were in violation of the primary annual standard compared with 54% in 1976. In Cook County outside of Chicago 5 out of 28 sites (18%) were above the primary annual standard while 19% were above the standard in 1976. The remaining four sites with values above the standard are located in Will County (3 sites) and in Bensenville (1 site). As a comparison of the magnitude of the changes from 1976 to 1977 for the 21 sites above the annual primary standard, the annual average for 8 sites decreased more than 5 ug/m³; 4 increased more than 5 ug/m³; and the remaining 9 did not change either way by more than 5 ug/m³. Figures 4 and 5 are maps of Cook County, including Chicago, and the Joliet area showing the annual geometric means.

A total of 10 sites recorded violations (more than one excursion) of the 24-hour primary standard of 260 ug/m^3 . All of the sites having violations were in the City of Chicago. However, 3 of the 10 sites with violations recorded one of their two excursions (resulting in the violation) on January 28 during blizzard conditions. Washington High School in Chicago recorded the most excursions with 19 and the highest 24-hour average (in both the AQCR and the State) with a value of 1106 ug/m^3 .

SULFUR_DIOXIDE

A total of 44 sites recorded sufficient data to obtain valid annual averages. The highest annual averages were .02 ppm recorded in Calumet City, Chicago Heights and Hillside. Figure 6 is a map of Cook County, including Chicago, listing the valid annual averages.

Three sites, Blue Island, Calumet City, and Chicago-CAMP, recorded single excursions (no violations) of the 24-hour primary standard of .14 ppm. Blue Island recorded the highest 24-hour average with a value of .158 ppm. There were no excursions of the 3-hour secondary standard of .5 ppm.

NITROGEN DIOXIDE

The continuous Air Monitoring Program (CAMP) station in Chicago again recorded the highest nitrogen dioxide value in the State. However, an inconsistency has arisen since the gas bubbler value (.057 ppm) is significantly different than the value (.048 ppm) obtained from the

continuous monitor (8,322 hours of data) even when the effect of the sampling schedules is taken into account. At this time, the continuous monitor would be favored over the gas bubbler since the quality control and quality assurance aspects of its operation have shown the data to be reliable while the same analysis has not been made of the gas bubbler.

The G.S.A. Building in Chicago had a mean of .050 ppm, equal to the standard but not a violation.

OZONE

Ozone was monitored at 21 sites during at least part of the summer of 1977. Calumet City recorded the largest number of excursions of the 1-hour standard with 273, followed by Kenwood High School in Chicago, with 261. All sites that operated during the entire ozone season recorded at least two excursions and are in violation of the 1-hour primary standard of .08 ppm.

Waukegan measured the highest 1-hour average ever recorded in the State during 1977 with a value of .266 ppm. The only other site to record values in excess of .200 ppm was Kenwood High School in Chicago with a maximum average of .241 ppm.

CARBON MONOXIDE

A total of four sites, out of the twelve which reported carbon monoxide data, recorded excursions of the 8-hour primary standard of 9 ppm. Three of these four sites recorded more than one excursion and are in violation of the standard. A newly established central business district (CBD) site at 160 North LaSalle Street in Chicago, which began operation in April, 1977, recorded the most excursions of the 8-hour standard with 74 (73 violations). That same site also recorded the highest 8-hour average with a value of 16.0 ppm.

There were no values in excess of the 1-hour primary standard of 35 ppm. The highest 1-hour average was 22.3 ppm recorded at the Medical Center in Chicago.

NON-METHANE HYDROCARBONS

Two sites in Region 67 monitor for non-methane hydrocarbons. The Medical Center site recorded violations on 85% of the days with valid 6-9 a.m. averages, while the site in Joliet recorded violations on 98% of the days. The highest average was 3.9 ppm recorded at the Medical Center in Chicago.

COOK COUNTY INCLUDING CHICAGO

TOTAL SUSPENDED PARTICULATES ANNUAL GEOMETRIC MEAN

(MICROGRAMS PER CUBIC METER)

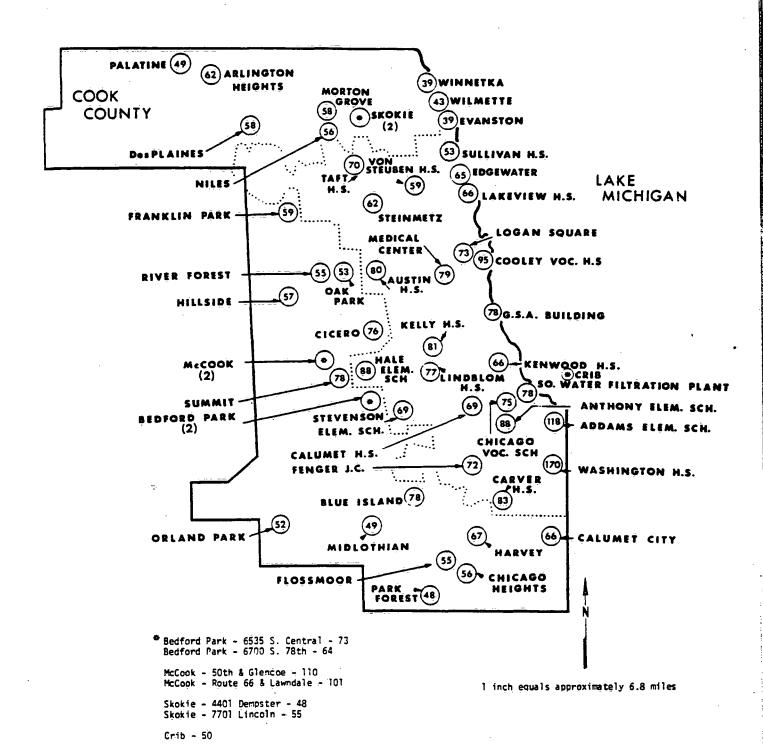
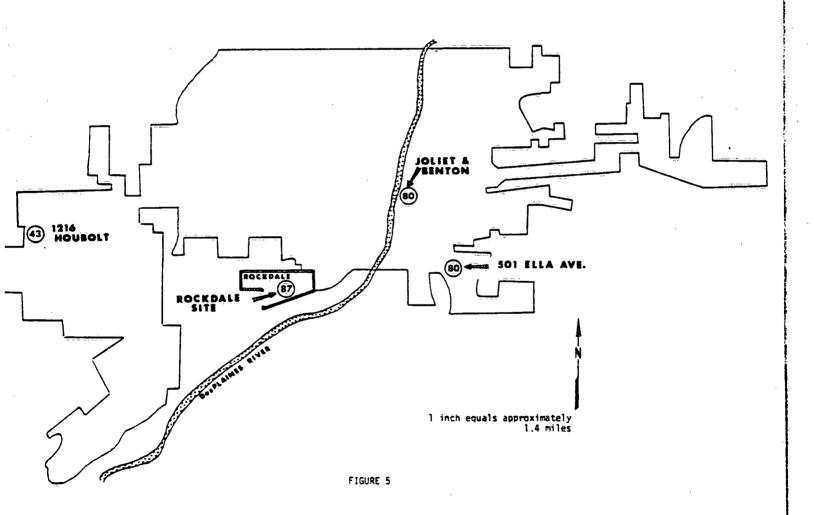


FIGURE 4

JOLIET

TOTAL SUSPENDED PARTICULATES ANNUAL GEOMETRIC MEAN

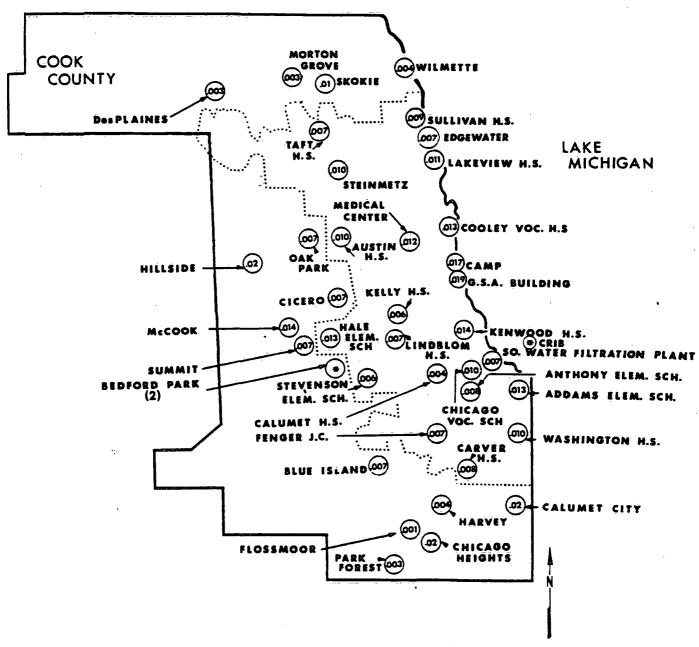
(MICROGRAMS PER CUBIC MÉTER)



COOK COUNTY INCLUDING CHICAGO

SULFUR DIOXIDE ANNUAL ARITHMETIC MEAN

(PARTS PER MILLION)



1 inch equals approximately 6.8 miles

*Bedford Park - 6535 S. Central - .016 Bedford Park - 6700 S. 78th - .004

CRIB - .009

FIGURE 6

1977 TOTAL SUSPENDED PARTICULATES

(MICROGRAMS PER CUBIC METER)

STATION	ADDRESS		MBER AMPLE			HIGH			ANN STATI	
31211011	700,000	TOTAL	>150 UG/M ³	>260 UG M ³	lst	2 nd	3rd	4th	GEOMETRIC MEAN	STD. GEO.
COOK COUTTY Arlington Heights Bedford Park Bedford Park Blue Island Blue Island (RASN) Calumet City Chicago Heights Chicago Heights Cicero Des Plaines Evanston Flossmoor Franklin Park Glenview Harvey Hillside McCook McCook Midlothian Morton Grove Niles Oak Park Orland Park Palatine Park Forest River Forest Skokie	33 S. Arlington Heights Rd. 6535 S. Central 6700 S. 78th Avenue 12700 Sacramento 12700 Sacramento 12700 Sacramento 755 Pulaski Road 450 State Street Dixie Highway and 10th 15th St. and 50th Avenue 1755 S. Wolf Road 1454 Elmwood 999 Kedzie Avenue 3400 N. Rose Street 1930 Prairie Street 1930 Prairie Street 1930 Prairie Street 1950 Thand Lexington Wolf Road and Harrison 50th Street and Glencoe Route 66 and Lawndale 15202 Crawford Avenue 9111 Waukegan 8955 Greenwood Avenue Lake and Grove St. 133rd and LaGrange 1000 Quentin Road 100 Park Avenue Lathrop and Oak Avenue 4401 Dempster 7701 Lincoln 60th and 74th Avenue 9th Street and Central Ave. 112 Willow	115 60 60 115 4 111 24 108 101 111 52 107 113 30 106 113 56 110 109 114 109 115 54 111 113 56 111 109 115 111 111 111 111 111 111 111 111 11	2201075341013192503210131110100	000-0-00000000000000000000000000	168 254 133 282 117 264 2191 210 157 113 174 179 219 219 219 219 219 219 219 219 219 21	152 155 126 216 70 208 178 172 89 144 160 125 221 166 187 217 154 151 142 156 134 125 113 186 134 125 113	147 146 125 205 216 175 160 141 156 124 215 145 145 145 145 145 145 145 145 145 1	146 127 117 196 56 183 172 147 155 138 138 1207 126 179 187 142 125 127 134 138 114 128 93 106 163 163 181	62 73 64 78 66 56 76 59 55 57 110 101 49 58 53 54 49 48 55 48 55 78 43 39	1.55 1.50 1.49 1.55 1.63 1.65 1.54 1.57 1.58 1.57 1.58 1.62 1.62 1.62 1.62 1.62 1.62 1.62 1.62
Chicago: Addams Elementary School Anthony Elementary School Austin West High School Calumet High School Carver High School Coley Vocational H.S. Cooley Vocational H.S. Crib Edgewater Farr Dormitory Fenger Junior College G.S.A. Building Hale Elementary School Kelly High School Lakeview High School Lindblom High School Lindblom High School Logan Square Medical Center South Water Filt. Plant Steinmetz High School Stevenson Elem. School Sullivan High School Von Steuben High School Wasnington High School	10810 S. Avenue "H" 9800 S. Torrence Avenue 118 North Central 8131 South May Street 801 East 133rd Place 445 Plymouth Court 320 North Clark 2100 East 87th Street 1225 North Sedgwick 68th St. and Lake Michigan 5358 North Ashland Avenue 3300 South Michigan Avenue 11220 South Wallace 538 South Clark 6140 South Melvina Avenue 4136 South California 5015 Blackstone 4015 North Ashland 6130 South Wolcott Avenue 2960 West Cortland Avenue 1947 West Polk 3300 East Cheltenham 3030 N. Mobile Avenue 8010 South Kostner Avenue 6631 North Bosworth 5625 North Natoma 5039 North Kimball Avenue 3500 East 114th Street	114 109 114 112 108 7 4 105 114 67 101 29 106 111 113 1106 56 58 92 111 106 109 113	33 17 10 8 13 10 10 10 10 11 11 11 11 11 13 11 11 11 11 11 11 11	8 T O T 2 O O O 2 T O O O O 2 T O O O O O	385 313 238 278 292 202 108 2373 152 218 245 225 378 379 251 288 160 177 405 219 429 156 276 176	351 248 187 255 285 174 781 245 148 208 155 277 221 287 241 300 204 261 148 261 148 261 148 261 148 261 159 688	342 232 173 213 235 115 74 200 235 145 167 1245 183 280 233 261 178 230 1464 269 136 237 210 154 617	329 230 170 175 232 98 44 177 234 136 157 140 213 215 175 175 133 170 121 207 148 601	118 88 80 69 83 ** 75 50 65 77 78 88 81 66 66 77 79 62 69 53 70 59 170	1.69 1.65 1.70 1.60 1.62 1.57 1.99 1.62 1.59 1.54 1.76 1.71 1.58 1.51 1.51 1.53 1.59 1.54 1.71

^{*}Did not meet minimum statistical culling criteria (See Section 4.1.).

1977 TOTAL SUSPENDED PARTICULATES

(MICROGRAMS PER CUBIC METER)

STATION	ADDRESS	NU S	MBER AMPLE	OF S		HIGI SAM	IEST		ANN STATI	STICS
JIZHON	A	TOTAL	>150 UG/M ³		lst	2nd	3rd	4th	GEOMETRIC MEAN	STD. GEO DEVIATION
DURAGE COUNTY Addison Bensenville Bensenville	130 West Army Trail Road Main and York 375 Meyer	56 56 59	0 10 2	0	112 267 159	108 213 154	107 211 146	100 209 143	54 88 63	1.43 1.68 1.63
Elmhurst Naperville West Chicago West Chicago Wheaton	118 Schiller 175 Jackson Street DùPage County Airport 128 W. McConnell 201 Reber Street	58 57 55 54 59	2 1 0 2 0	00000	235 165 127 179 145	160 135 119 167 130	147 125 118 135 111	130 123 109 131 108	71 58 48 56 59	1.68 1.63 1.53 1.52 1.51 1.47 1.53
<u>KANE COUNTY</u> Elgin <u>Kankakée County</u>	1002 North Liberty	42	0	0	139	118	-117	117	56	1.56
Bradley KENDALL COUNTY	610 East Liberty	51	4	1	281	<u>2</u> 06	167	166	70	1.72
Plano LAKE COUNTY	Main Street	24	0	0	135	122	114	109	•	
Island Lake Lake Bluff North Chicago (RASN) Waukegan Waukegan Waukegan Maukegan McHENRY COUNTY	Island Lake Grade School 121 East Sheridan 1850 Lewis Avenue 106 Utica Golf and Jackson 2200 Brookside	56 55 36 60 44 58	0000	00000	155 124 145 159 139 143	101 88 140 151 127 117	99 86 100 149 127 110	95 75 91 148 106 110	47 40 62 46 52	1.59 1.52 1.56 1.74 1.52
Cary Crystal Lake	lst St. and Three Oaks Rd. Franklin and Caroline	51 45	0	0 0	126 108	110 99	84 98	82 80	41 44	1.55 1.49
Crété Joliet Joliet Joliet Joliet Joliet Joliet Joliet Lockbort Mokéna Monée Pláinfield Rockdale Romeoville Wilmington	North and Elizabeth 5 East Van Buren Midland and Campbell 1425 North Broadway Copperfield and Briggs Joliet and Benton 1216 Houbolt 501 Ella 5th and Madison 10940 Front Street 432 East Main Street 1005 Eastern Well #2 Pump Station Naperville Road South Joliet Street	39 38 44 30 29 56 49 38 44 52 40 44 44	010206032313320	010000000000000000000000000000000000000	108 368 146 163 142 210 127 165 164 207 188 165 262 160 123	99 137 146 154 81 200 95 161 177 140 162 158 155 111	98 128 139 61 171 87 158 150 162 134 155 146 110	80 128 121 120 59 163 86 135 146 143 109 135 150 135	* * * * 80 40 80 80 80 80 80 80 80 80 80 80 80 80 80	1.69 1.57 1.51 1.64 1.56 1.62 1.62 1.46 1.71

Did not meet minimum statistical culling criteria (See Section 4.1).

1977 SHORT-TERM TRENDS FOR TOTAL SUSPENDED PARTICULATES

				ANNUAL	MEAN (ig/M ³)		
STATION	ADDRESS	1971	1972	1973	1974	1975	1976	1977
COOK COUNTY Arlington Heights Bedford Park Bedford Park Bedford Park Blue Island Calumet City Chicago Heights Chicago Heights Cicero Des Plaines Evanston Flossmoor Franklin Park Glenview Harvey Hillside McCook McCook Midlothian Morton Grove Niles Oak Park Orland Park Palatine Park Forest River Forest Skokie Skokie Skokie	33 S. Arlington Heights Rd. 6535 South Central 6700 South 78th Avenue 12703 Sacramento 755 Pulaski Road 450 State Street Dixie Highway and 10th 15th Street and 50th Avenue 1755 South Wolf Road 1454 Elmwood 999 Kedzie Avenue 3400 North Rose Street 1930 Prairie Street 1930 Prairie Street 157th and Lexington Wolf Road and Harrison 50th Street and Glencoe Route 66 and Lawndale 15202 Crawford Avenue 9111 Waukegan 8955 Greenwood Avenue Lake and Grove Street 133rd and LaGrange 1000 Quentin Road 100 Park Avenue 4401 Dempster 7701 Lincoln 60th and 74th Avenue 9th Street and Central Ave. 112 Willow	99 830 68 - 61 77 53 45 45 65 89 88 114 54 70 47 50 6- 7 47 50 6- 7 45 47 50 6- 7 45 45 47 47 45 47 47 47 47 45 45 45 45 45 45 45 45 45 45 45 45 45	105 866 807 744 600 553 1120 42 516 48 33 434 54 52 38 61	93 88 97 71 60 88 97 71 60 63 78 67 125 78 61 65 67 67 67 67 67 67 67 67 67 67 67 67 67	+ 104 933 990 + 789 57 42 639 544 64 573 61 575 68 574 574 574 574 574 574	72 104 79 92 77 139 63 90 61 41 58 79 68 65 51 65 51 67 39 48 88 88 88 88	67 78 69 75 63 75 66 10 11 59 47 58 42 42	62 73 64 78 66 76 58 39 55 57 110 101 49 58 59 49 48 55 49 48 55 78 43 39
Chicago: Addams Elem. School Anthony Elem. School Austin West High School Calumet High School Carver High School Carver High School Camp Central Office Building Chicago Voc. High School Cooley Voc. High School Crib Edgewater Farr Dormitory Fenger Junior College G.S.A. Building Hale Elementary School Kenwood High School Lakeview High School Lindblom High School Lindblom High School Logan Square Medical Center So. Water Filt. Plant Steinmetz High School Stevenson Elem. School Sullivan High School Taft High School Von Steuben High School Washington High School	10810 South Avenue "H" 9800 South Torrence Avenue 118 North Central 8131 South May Street 801 East 133rd Place 445 Plymouth Court 320 Clark 2100 East 87th Street 1225 North Sedgwick 68th St. and Lake Michigan 5358 North Ashland 3300 South Wichigan Avenue 11220 South Wallace 538 South Clark 6140 South Welvina 4136 South California 5015 Blackstone 4015 North Ashland 6130 South Wolcott Avenue 2960 West Cortland Avenue 1947 West Polk 3300 E. Cheltenham 3030 North Mobile Avenue 8010 South Kostner Avenue 6631 North Bosworth 5625 North Natoma 5039 North Kimball Avenue 3500 East 114th Street	132 102 - 92 108 173 115 99 132 - 109 91 93 83 104 122 95 72 87 84 76 85 168	115 97 - 80 101 155 97 84 116 - 87 79 101 87 96 80 89 85 103 67 67 83 71 70 48	122 91 - 82 92 156 82 82 126 62 - 79 108 76 88 76 88 78 77 68 78 79 65 76 64 163	129 95 -80 73 120 + 91 112 - 85 103 80 90 70 75 + 81 86 68 69 63 76 64 153	105 86 * 69 73 121 * 76 94 * - * 80 95 85 70 67 75 77 60 70 148	131 90 89 73 91 122 ** 79 94 69 * 80 88 83 71 72 67 67 64 77 58 64 175	118 88 80 69 83 ** 75 95 50 65 * 72 78 88 81 66 67 77 73 79 78 69 53 70 59 50 50 50 50 50 50 50 50 50 50 50 50 50

Site no in operation during year shown.

Did not meet minimum statistical culling criteria (see section 4.1)

1977 SHORT-TERM TRENDS FOR TOTAL SUSPENDED PARTICULATES

	Apparés			ANNUAL	MEAN (ug M ³)		·
STATION	ADDRESS	1971	1972	1973	1974	1975	1976	1977
DuPAGE COUNTY Addison Bensenville Bensenville Elmhurst Naperville West Chicago West Chicago Wheaton	130 West Army Trail Road Main and York 375 Meyer 118 Schiller 175 Jackson Street DuPage County Airport 128 West McConnoll 201 Reber Street	72 160 - 94 - - - 75	91 114 95 * *	81 110 	66 100 • 73 69 51 58 40	68 93 55 69 68 68 70	53 109 57 69 58 51 59 58	54 88 63 71 58 48 56 59
KANE COUNTY Elgin KANKAKEE COUNTY Bradley KENDALL COUNTY Plano LAKE COUNTY Island Lake	1002 North Liberty	89	92	56	57	60	59	56
<u>KANKAKEE COUNTY</u> Bradley	610 East Liberty	-		-	-	•	*	70
<u>KENDALL COUNTY</u> Plano	Main Street	-		٠	-	•	62	•
LAKE COUNTY Island Lake Lake Bluff North Chicago Waukegan Waukegan Waukegan Waukegan	Island Lake Grade School 121 East Sheridan 1850 Lewis Avenue 106 Utica Golf and Jackson 2200 Brookside	89 50 68 86 -	53 55 68 83 -	58 43 63 69	41 39 • 58 -	47 42 51 65 -	46 43 54 58 *	47 40 * 62 46 52
<u>McHENRY_COUNTY</u> Cary Crystal Lake	lst St. and Three Oaks Rd. Franklin and Caroline	44	<u>64</u> 53	* *	60 +	± 46	÷ 49	41 44
WILL COUNTY Crete Joliet Joliet Joliet Joliet Joliet Joliet Lockport Mokena Monee Plainfield Rockdale Romeoville Wilmington	North and Elizabeth 5 East Van Buren Midland and Campbell 1425 North Broadway Copperfield and Briggs Joliet and Benton 1216 Houbolt 501 Ella 5th and Madison 10940 Front Street 432 East Main Street 1005 Eastern Well #2 Pump Station Naperville Road South Joliet Street	96 87 98 97 114 - 87 61 - 112 78	84 105 97 97 84 95 - 72 49 - 104 48	56 81 68 78 63 61 63 61 41 - 80 36	65 * 87 86 72 78 59 85 74 73 63 * 112 77	60 77 71 78 72 94 53 79 70 61 48 •	72 91 72 * 71 83 75 82 68 73 64 86 104 *	* * * * * * * * * * * * * * * * * * *

⁻ Site not in operation during year shown.

Did not meet minimum statistical culling criteria (see section 4.1)

1977 SULFUR DIOXIDE

(PARTS PER MILLION)

STATION	ADDRESS	Ν	UMBE SAMI	PLES			HIGH MPLE	S (PP		ANN STATI	IUAL STICS
51,711,011			24 HR	IAVGSI	24-HR AVGS					ARITH. MEAN	STD. GEO.
		I HK	24 MK	>.5	>.14	151	2nd	-Ase	2 nd	MEAN	DEVIATION
COOK COUNTY											
Bedford Park Bedford Park Blue Island Blue Island (RASN) Calumet City	6535 South Central 6700 South 78th 12700 Sacramento 12700 Sacramento 755 Pulaski	7181 7504	58 57 116 6	0 A A A A A A A A A A A A A A A A A A A	00010100	.321 NA NA NA NA .21 NA	.110 NA NA NA .16 NA .12	.086 .017 .017 .158 .049 .15	.046 .015 .016 .085 .029 .12	.016 .005 .004 .007	1.90 2.05 1.78 3.65 2.61 2.32
Chicago Heights Cicero Des Plaines Flossmoor Harvey Hillside McCook Morton Grove Oak Park Park Forest Skokie	Dixie Highway and 10th 15th Street and 50th Avenue 1755 South Wolf Road 999 Kedzie 157th and Lexington Wolf Road and Harrison 50th Street and Glencoe 9111 Waukegan 834 Lake Street 100 Park Avenue 9800 Lawler	7600 7591 7216	113 117 112 117 108 116 115 114 113		000000000000	16 NA NA NA NA NA NA NA NA NA NA NA	NA NA NA NA NA 15 NA 17 NA NA NA 08 NA	.06 .030 .053 .028 .031 .038 .035 .058 .027 .043 .042 .05	.06 .027 .048 .027 .025 .034 .07 .033 .058 .021 .039 .025 .04	.02 .003 .007 .003 .004 .004 .02 .002 .014 .003 .007 .003	2.32 2.31 2.64 3.62 2.38 2.79 2.87 2.31 2.02 2.20 2.53 3.49 2.57 2.57 2.03
Summit Wilmette Chicago:	60th and 74th Avenue 9th Street and Central Ave.		111 115	NA NA	0	NA NA	NA NA	.034 .059	.027 .040	.007 .004	3.30 2.70
Addams Elementary School Anthony Elementary School Austin West High School Calumet High School Carver High School	10810 South Avenue "H" 9800 South Torrence 118 North Central 8131 South May 801 East 133rd Place 445 Plymouth	1377 7365	58 53 60 61 58	NA NA NA NA NA NA	00000-0	NA NA O6 NA NA NA 207	NA NA .05 NA NA NA .173		.044 .040 .02 .044 .013 .039 .116	.013 .008 .010 .004 .008	3.58 3.23 3.14 2.64 3.19
Cermak Pump Station Central Office Building Chicago Vocational H.S. Cooley Vocational H.S. Crib Edgewater Fenger Junior College G.S.A. Building Hale Elementary School	735 West Harrison 320 North Clark 2100 East 87th Street 1225 North Sedgwick 68th St. and Lake Michigan 5358 North Ashland	3204 1859	0 60 61 36 56	O , A , A O A , NA O A	0100000	.10 NA NA NA .07	.10 NA NA NA .07 NA	.08 .053 .083 .073 .04 .049	.06 -051 .080 .024 .04	.010 .013 .009	3.13 4.24 2.86 3.09
	11220 South Wallace 538 South Clark 6140 South Melvina 4136 South California 5015 Blackstone	2102	60 56 61 60	NA NA NA NA NA	0000000	.07 NA NA NA NA O4	.06 NA NA NA NA .04	.03 .041 .115 .082 .031 .03	.03 .037 .092 .043 .029 .03	.007 .019 .013 .006	3.24 4.22 2.96 2.91 2.61
Kenwood High School Lakeview High School Lindblom High School Medical Center South Water Filt. Plant State Office Building Steinmetz High School Stevenson Ele. School Sullivan High School Taft High School Washington High School DuPAGE COUNTY Bensenville	4015 N. Ashland 6130 S. Wolcott 1947 West Polk 3300 E. Cheltenham 160 North LaSalle 3030 North Mobile 8010 South Kostner	3777 7883 5854 2015	61 60 56 59	NA O NA O NA O NA	00000000	NA .05 NA .214 NA .205 NA	NA .05 NA .149 NA .200 NA	.04 .043 .076 .022 .122 .049	.067 .04 .038 .073 .017 .120 .039	.011 .007 .012 .005	3.25 3.26 2.13 2.63 3.14
Sullivan High School Taft High School Washington High School	6631 North Bosworth 5625 North Natoma 3500 E. 114th Street	1813	57 60 56 60	NA NA O NA NA	0000	NA NA .05 NA NA	NA NA .05 NA NA	.051 .04		.006 .009 .007 .010	2.94 3.25 3.27 3.40
<u>DuPAGE COUNTY</u> Bensenville	375 Meyer		44	NA .	0	NA	NA.	.037	.024	.007	2.48

NA - Not applicable

Did not meet minimum statistical culling criteria (see section 4.1).

1977 SULFUR DIOXIDE

(PARTS PER MILLION)

STATION	ADDRESS	Ν	UMBI SAM	ER OI PLES		SA	HIGH	IEST S (PP		ANN STATI	
		1 HR	24 HR	3 - HR AVGS > 5		ist	2nd	lst.		ARITH. MEAN	STD. GEO. DEVIATION
<u>LAKE COUIT:</u> Waukegan Waukegan	Golf and Jackson 3010 Grand Avenue	6641	4 6	٥ ::ع	0.0	.100 14	.095 AI:	.087 .042	.081 .020	.012 .006	2.07 2.35
WILL COMIT: Joliet Joliet Löckport Rockdale Romeoville	Midland & Campbell Joliet and Benton 5th and Madison Well #2 Pump Station Naperville Poad	eoei Eecs	32 30 31 13	NA OA HE	00000	172 172 184 194 194	AR 280. AR AR AR	.023 .045 .016 .025	.018 .038 .011 .021 .013	.008	1.74

NA · Nat applicable

Did not meet minimum statistical culting criteria (see section 4.1).

1977 SHORT-TERM TRENDS FOR SULFUR DIOXIDE

				ANNUAL	MEAN (ug: M ³)		
STATION	ADDRESS	1971	1972	1973	1974	1975	1976	1977
COOK COUNTY Bedford Park Bedford Park Blue Island Calumet City Chicago Heights Citero Des Plaines Flossmoor Harvey Hillside McCook Morton Grove Oak Park Park Park Forest Skokie Summit Wilmette	6535 South Central 6700 South 73th 12700 Sacramento 755 Pulaski Dixie Highway and 10th 15th St. and 50th Avenue 1755 South Wolf Road 999 Kedzie 157th and Lexington Wolf Road and Harrison 50th and Glencoe 7111 Waukegan 834 Lake Street 100 Park Avenue 9800 Lawler 60th and 74th Avenue 9th St. and Central Avenue	.028 .026 .013 .013 .013 .015 .005 .037 .023 -004 .007	.017 .022 .004 .009 .012 .012 .017 .007 .035 .005	.016 .016 .006 .009 .011 .012 .001 - .008 .004 .035 .004 -	.021 -016 .012 .012 .010 .002 -009 .006 	.007 .006 .029 .010 .009 .010 .004 * .011 .006 * *	.018 .005 .019 .02 .007 .003 .008 .005 .003 .015 .004 - - .002 .02	.016 .004 .007 .02 .007 .003 .004 .004 .02 .014 .003 .007 .003 .01 .007
Chicago: Addams Elem. School Anthony Elem. School Austin West High School Calumet High School Carver High School CAMP Cermack Pumb Station Central Office Building Chicago Vocational H.S. Cooley Vocational H.S. Crib Edgewater Fenger Jr. College G.S.A. Building Hale Elem. School Kelly High School Lindblom High School Lindblom High School Medical Center South Water Filt. Plant Steinmetz High School Stevenson High School Sullivan High School Taft High School Taft High School	10810 South Avenue "H" 9800 South Torrence 118 North Central 8131 South May 801 East 133rd Place 445 Plymouth 735 West Harrison 320 North Clark 2100 East 87th Street 1225 North Sedgwick 68th and Lake Michigan 5358 North Ashland 11220 South Wallace 538 South Clark 6140 South Melvina 4136 South California 5015 Blackstone 4015 North Ashland 6130 South Wolcott 1947 West Polk 3300 East Cheltenham 3030 North Mobile 8010 South Kostner 6631 North Bosworth 5625 Horth Natoma 3500 East 114th Street		.020 .015 .023 .022 - .014 .025 .027 .026 .027 .027 .027 .018 .016 .014 .014	.026 .011 .016 .016 .016 .014 .022 .016 .030 .021 .019 .019 .019 .019 .019	.021 .003 .013 .013 .019 .016 .012 .021 .014 .023 .014 .010 .013 .031 .008 .007 .014 .010	.016 .007 .009 .008 .019 .019 .016 .011 .011 .011 .011 .011 .011 .006 .007 .013	.015 .009 .006 .007 .010 .020 .010 .008 .011 .009 .013 .012 .007 .007 .007 .008 .005 .005	.007 .003 .013 .007 .004 .013 .008 .010 .004 .013 .009 .017 .013 .009 .017 .019 .013 .007 .014 .011 .007 .012 .005 .010

z Site not in öperation during year shown.

Did not most minimum statistical culling criteria (see section 4.1)

1977 NITROGEN DIOXIDE

(PARTS PER MILLION)

STATION	ADDRESS	NO. SAM	OF PLES		QUART AVERAGE:	ERLY S(PPM)	-	ANN STATI	UAL STICS
		1 HR	24 HR	lst	2nd	3rd	4 th	ARITH. MEAN	STD. GEQ. DEVIATION
Blue Island Blue Island (PASM) Calumet City Chicago Heights Cicero Des Plaines Flossmoor Harvey Hillside Morton Grove Oak Park Park Forest Skokie Summit Wilmette Chicago:	12700 Sacramento 12700 Sacramento 755 Pulaski Dixie Highway and 10th St. 15th Street and 50th Ave. 1755 South Wolf Road 999 Kedzie 157th and Lexington Wolf Road and Harrison 9111 Waukegan 834 Lake Street 100 Park Avenue 9800 Lawler 60th and 74th Avenue 9th Street and Central Ave.		114 6 112 114 117 113 116 107 114 115 113 115 114 116	.030 .020 .023 .025 .036 .033 .026 .037 .037 .037	.039 -034 .034 .040 .040 .035 .043 .040 .042 .044 .034 .034	.052 .049 .044 .050 .052 .045 .054 .058 .056 .047 .051	.033 .029 .035 .042 .035 .033 .037 .041 .040 .031 .041	.039 + .034 .035 .046 .040 .035 .041 .041 .045 .033 .047	1.47 1.59 1.53 1.46 1.56 1.54 1.47 1.46 1.47 1.49 1.55 1.55
Addams Elementary School Anthony Elem. School Austin West High School Calumet High School Carver High School Carver High School CAMP Central Office Building Chicago Vocational H.S. Cooley Vocational H.S. Crib Edgewater Fenger Junior College G.S.A. Building Hale Elementary School Kelly High School Kenwood High School Lakeview High School Lindblom High School Medical Center South Water Filt. Flant State Office Building Steinmetz High School Stevenson Elem. School Sullivan High School Washington High School	10810 South Avenue "H" 9800 South Torrence 118 North Central 8131 South May 801 East 133rd Place 445 Plymouth 320 North Clark 2100 East 87th Street 1225 North Sedgwick 68th St. and Lake Michigan 5358 North Ashland 11220 South Wallace 538 South Clark 6140 South Wallace 538 South Clark 6140 South Wallace 538 South Clark 6140 South Wallace 1365 Blackstone 4015 North Ashland 6130 South Wolcott 1947 West Polk 3300 East Cheltenham 160 North LaSalle 3030 North Mobile 8010 South Wostner 6631 North Bosworth 5625 North Natoma 3500 East 114th Street	8322 8075 3306	58 53 60 61 58 55 60 61 60 61 60 57 59 57 60 56 60 60 60 60 60 60 60 60 60 60 60 60 60	.037 .039 .041 .033 .040 .052 * .036 .034 .034 .035 .037 .039 .038 .025 .025 .026 .037	.033 .035 .044 .037 .062 .062 .062 .035 .044 .027 .044 .029 .049 .041 .034 .045 .041 .055 .028 .071 .039 .035	.047 .039 .056 .040 .038 .060 .047 .028 .045 .045 .045 .041 .046 .047 .048 .031 .034 .034 .034	.038 .047 .035 .038 .047 .035 .054 .040 .040 .040 .027 .048 .036 .039 .039 .039 .028 .039 .039 .033 .033 .033 .033	.038 .037 .037 .036 .048 .057 * .038 .044 .032 .041 .028 .050 .038 .042 .039 .043 .040 .029 * .039 .032 .034 .032	1.51 1.39 1.32 1.47 1.41
DuPAGE COUNTY Bensenville LAKE COUNTY	375 Meyer		49	.029	.025	.025	.026	.026	1.60
Waukegan	3010 Grand Avenue		45	.030	.027	.023	.024	.026	1.47
WILL COUTY Joliet Joliet Lockport Rockdale Romeoville	Midland and Campbell Joliet and Benton 5th and Madison Well #2 Pump Station Naperville Road	7551	27 29 31 10	.032	.019 .035 .017 .023 .019	.019 .036 .017 .025	.029 * * *	.033 + +	1.85

^{* -} Did not meet minimum statistical culling criteria (See Section 4.1

1977 OZONE

(PARTS PER MILLION)

		NO. SAMI					Н	IGHES	T SAA	APLES	(PPM)		
STATION	ADDRËSS		80. <									ANN	UAL
		TOTAL	PPM	MAR	APR	MAT	JUNE	JULY	AUG	SEPT	OCT	lst	2nd
COOK COUNTY													
Arlington Heightsl	33 S. Arlington Hts.	4253	94	NS	.143	.167	.113	.135	. 081	.089	.039	.167	.159
Bedford Park	6535 South Central	6433	38	.040	(11) .140	(36) .120	(24) .100	(19) .100	(1) 090.	(3) .070	สร	.140	.140
Calumet City	755 Pulaski Road	7579	273	.055	(8) .105	(18) .151	(4) .121	(5) .144	(3) .092	.087	.057	.151	.148
Chicago Heights	Dixie Hwy. & 10th St.	76 6 3	93	.062	(13) .086	(129) .138	(38) .104	(81) .090	(9) .129	(3) .061	.050	.138	.129
Evans ton 1	531 Lincóln	2536	1	HS	. (6) NS	(32) #S	(20) NS	(10) %S	(25) NS	.087	.062	.087	.079
Hillside	Wolf and Härrison	8337	230	.069	.107	.138	.122	.141	.105	(1) .084	.047	.141	.138
Skokie	9800 Lawler Street	8535	138	.062	(7) .167	(61) -141	(43) .176	(82) .185	(5) .192	(2) .056	.044	.192	.185
					(23)	(34)	(28)	(46)	(7)				
Chicago:	118 North Central	4854											
Austin West H.S.	3		9	.034	.037	.093 (8)	.088	.063	.034	.037	.017	.093	.088
CAMP	445 Plymouth	7357	3	.030	.040	NS	.080	.130 (2)	.085 (1)	.050	.025	.130	.090
CAMP Cermak Pump Station Edgewater Kenwood High School Lindblöm H.S. Medical Center		5026	2	.023	.018	.042	.012	.107 (2)	.060	.023	.023	.107	.105
Edgewater	5358 North Ashland	3387 6334	29	.057	.141 (4)	.167 (22)	.105	.044	.053	NS	NS 042	.167	.141
Kenwood High School		,	261	.051	.063	.207 (119	.142	.241 (83)	.190 (13)	.081 (1)	.047	.241	.207
Lindblöm H.S.	6130 South Wolcott	6389 7761	18 94	.029	.061	.136 (8)	.087	.122 (7)	.091	.051	.030	.136	.122
Medical Center Stevenson Ele. Sch.	1947 West Polk	4285	11	.053 .057	.132	.155 (40)	.114 (19)	.147 (21)	-097 (4)	.058 .055	.032 NS	.155	.147
		4353	''	.US7 NS	.134 (10)	.081 (1)	.077	.076	.060	.033	.023	.134	.126
	160 North LaSalle 5225 N. Natoma		9	112	NS	NS	.022	.128 (6)	.121 (3)	.044	.023	.128	.128
Taft High School	35223 M. Natoma	0		•				•	-	-	-	_	-
DUPAGE COUNTY													100
Wheatori ¹	111 N. County Farm Rd	4972	120	.052	.130		.118		.058	.053	.034	.155	.136
					(24)	(52)	(32)	(12)					
KANKAKEE COUNTY													
Kankakeel	109 Indiana	3966	196	NS	кѕ	.154	.145	.118	.072	.142	.047	.154	.152
		1				(32)	(42)	(57)		(5)			
LAKE COUNTY		1											
Libertyville	1441 Lake Street Golf and Jackson	731 5657	0 169	NS NS	NS .074	NS -266	NS .170	NS 196	NS 104	.053 .081		.056	.056 .261
Waukegan I	Anna and nacksou	363/	103	ζ.	.0/4	(92)	(42)	.186 (29)	.194 (5)	.081		.265	.201
WILL COUNTY													
	Joliet and Benton	7851	124	.060	.090	.160	,110	.143	.103	104	.044	.160	.155
Joliet S	Joriet and benton	/031	184	ייסט	(6)	(55)	(23)	(28)	(6)	(6)		.100	.133
e .													
	<u>.</u>												100
		<u> </u>	1				<u></u>						9

NS - No samples

Numbers shown in parenthesis denote the number of samples exceeding .08 ppm in a given month.

Special Purpose Site

1977 CARBON MONOXIDE

(PARTS PER MILLION)

		NO OF	NUMBER OF	AVERAGES			HIGI	IEST		
STATION	ADDRESS	SAMPLES	1 - HR	8 - HR	1-H5	AVER	AGE	8-H	R AVER	AGE
			>35 PPM	> 9 PPM	1 st	2 nd	3 rd	1 st	2 nd	314
COOK COUNTY Calumet City Chicago Heights Hillside Skokie Chicago:	755 Pulaskí Road Dixie Hwy. & 10th St. Wolf Rd. & Harrison 9800 Lawler	7748 7940 8017 7796	0000	0 0 0 0	7.1 9.1 4.9 10.3	7.0 4.6 4.8 8.9	6.7 4.4 4.4 8.8	6.7 4.2 4.1 6.8	6.4 4.1 3.3 6.8	6.2 4.1 3.3 6.7
Austin W. H.S. CAMP Cermak Pump Station Daley Center Edgewater Medical Center State Office Bldg. Stevenson El. Sch. Sunnyside and Knox	118 North Central 445 Plymouth 735 West Harrison 121 North LaSaile 5358 Ashland 1947 West Polk 160 North LaSaile 8010 South Kostner 4632 West Sunnyside	0 8256 3381 6319 0 7543 6319 2502 2799	, 000,	30 0 1 - 0 74 0	11.7	11.4	20 12.9 14 - 12.0 20.3 11.3 13.5	- 13 8.8 10 - 7.9 16.0 7.3 12.8	13 8.5 9 6.5 14.6 6.0 10.9	13 8.2 9 6.2 14.5 5.8 10.5
WILL COUNTY Joliet	Joliet and Benton	8231	0	0	10.0	8.6	7.6	5.2	4.4	4.3

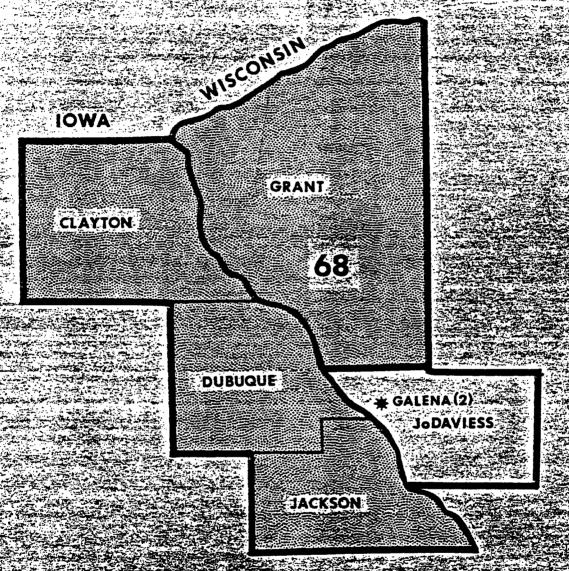
NON - METHANE HYDROCARBONS

(PARTS PER MILLION)

	ADDRESS	NO AVE	OF AGES	HIGHEST AVERAGES (PPM) (6-9 gm)											
STATION		TOTAL 6-9am	>.24 6-9am	NAL	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	ост	NOV	DEC
COOK COUNTY Chicago	1947 West Polk	323	274	2.4	1.4	1.7	1.5	1.8	1.6	3.9	2.7	2.4	2.2	2.6	2.5
WILL COUNTY Joliet	Joliet and Benton	216	211	2.5	1.2	2.2	1.5	1.8	2.3	NS	NS	NS	NS	2.5	2.4

NS - No Sample

AIR QUALITY CONTROL REGION 68 METROPOLITAN DUBUQUE INTERSTATE (IOWA-ILLINOIS-WISCONSIN)



Data for the Towa Wisconsin portion of this control region can be obtained from:

Lowa Department of Wisconsin Department of Environmental Quality, Natural Resources, 3920 Delaware Avenue, P.O. Box 3326, (515) 281-8692

Lowa Departmental Quality, Natural Natural Management, Bureau of Air Management, Box 7921, Des Moines, Iowa 50316 Madison, Wisconsin 53707 (608) 266-0603

(The number of sampling sites in each city is shown in parenthesis following the city name.)

METROPOLITAN DUBUQUE INTERSTATE (IOWA-ILLINOIS-WISCONSIN) AIR QUALITY CONTROL REGION (AQCR) 68

TOTAL SUSPENDED PARTICULATES

The only site in the Illinois portion of AQCR 68, Galena, recorded an annual geometric mean of 68 ug/m^3 ; less than the primary annual standard and similar to the geometric means recorded in 1975 and 1976. One 24-hour sample was found to be in excess of the 24-hour primary standard, but since only one was measured, no violation resulted. The concentration of the highest sample was 376 ug/m^3 .

SULFUR DIOXIDE

The annual arithmetic mean in Galena was .004 ppm which is well below the primary annual standard of .03 ppm. The maximum 24-hour sample was .019 ppm.

NITROGEN DIOXIDE

The site in Galena did not have a sufficient number and distribution of samples for a valid annual average.

OZONE, CARBON MONOXIDE, NON-METHANE HYDROCARBONS

Data not available for the Illinois portion of this air quality control region.

1977 TOTAL SUSPENDED PARTICULATES

(MICROGRAMS PER CUBIC METER)

STATION	ADDRESS		NUMBER OF SAMPLES			HIGH SAMI			ANNUAL STATISTICS		
	TOTAL	>150 UG/M ³	>260 UG/M3	lst	2 nd	3rd	4th	GEOMETRIC MEAN	STD. GEO. DEVIATION		
<u>JO DAVIESS COUNTY</u> Galena	311 S. Main St.	48	5	1	376	237	180	153	68	1.81	

SHORT-TERM TRENDS FOR TOTAL SUSPENDED PARTICULATES

	4000555			ANNUAL	MEAN (ug/M ³)		
STATION	ADDRESS	1971	1972	1973	1974	1975	1976	1977
JO DAVIESS COUNTY Galena	311 S. Main St.	-	•	•	-	70	70	68

SULFUR DIOXIDE

(PARTS PER MILLION)

STATION	ADDRESS		UMBI SAM	R OF		SA	HIGH MPLE	IEST S (PP	M)	ANN STATI	
JIANON		1 HR	24 HR	3 - HR AVGS >.5	24-hR AVGS >.14	3-HR	. AVG		2 nd	ARITH. MEAN	STD. GEO. DEVIATION
Jo Daviess County											
Galena	311 S. Main St.		47	NA	0	NΦ	NA	.019	.018	.004	2.05

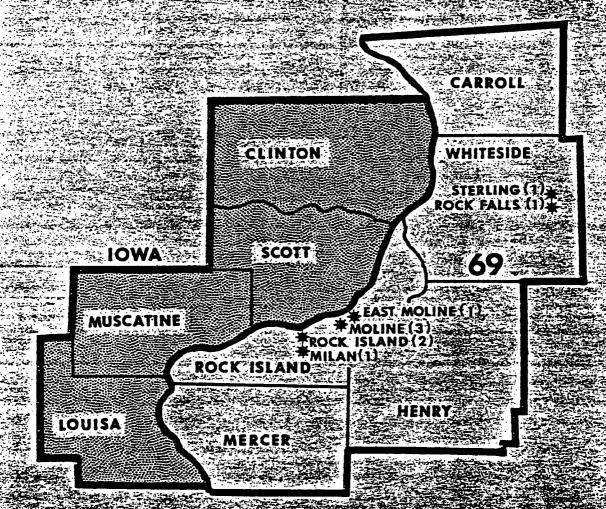
⁻ Site not in operation during year shown.

NA - Not applicable

NITROGEN DIOXIDE (PARTS PER MILLION)

STATION	ADDRESS		OF PLES		QUART AVERAGE	S(PPM)	_	ANN	STICS
		•	24 HR	Tst	2 nd	3rd	4th	ARITH. MEAN	STD. GEO. DEVIATION
JO DAVIESS COUNTY Galena	311 S. Main St.		42	.013	. 200	.011	•	•	

AIR QUALITY CONTROL REGION 69 METROPOLITAN QUAD CITIES INTERSTATE (ILLINOIS-IOWA)



Data for the lowa portion of this control region can be obtained from: Iowa Department of Environmental Quality:

3920 Delaware Avenue,

P. 0. Box 3326.

Des Moines, Iowa 50316

(515) 281-8692

(The number of sampling sites in each city is shown in parenthesis following the city name:

METROPOLITAN QUAD CITIES INTERSTATE (IOWA-ILLINOIS) AIR QUALITY CONTROL REGION (AQCR) 69

TOTAL SUSPENDED PARTICULATES

A total of seven sites recorded valid annual geometric means for 1977. Of these seven, two were in excess of the primary annual standard of 75 ug/m^3 . The site at 619 16th Avenue in Moline had a large decrease in the annual mean from 1976 to 1977. The value measured in 1976 was 81 ug/m^3 while 64 ug/m^3 was found in 1977. Figure 7 is a map of the Quad Cities area which shows the annual geometric means by site.

Two sites, Milan and 619 16th Avenue - Moline, recorded single excursions (no violations) of the 24-hour primary standard. The highest 24-hour averages were 330 μ m moline and 300 μ m in Milan.

SULFUR DIOXIDE

Only one site, East Moline, recorded a valid annual average with a value of .004 ppm, well below the primary annual standard of .03 ppm. Rock Island recorded the highest 24-hour average of .029 ppm.

NITROGEN DIOXIDE

The only site monitoring for NO2 in the Illinois portion of this AQCR, East Moline, recorded an annual average of .027 ppm. This is compared with the annual primary standard of .05 ppm.

OZONE

The monitoring site in Rock Island recorded 56 excursions of the 1-hour primary standard in,1977 compared with only 1 in 1976. The month of May accounted for 75 percent of the total number of excursions. The highest 1-hour average was .167 ppm while only .087 ppm was detected in 1976.

CARBON MONOXIDE

The monitoring site in Rock Island did not record excursions of either the 8-hour standard of 9 ppm or the 1-hour standard of 35 ppm. However, the highest 8-hour average of 8.9 ppm was bordering the 8-hour standard. The highest 1-hour sample was 12.2 ppm.

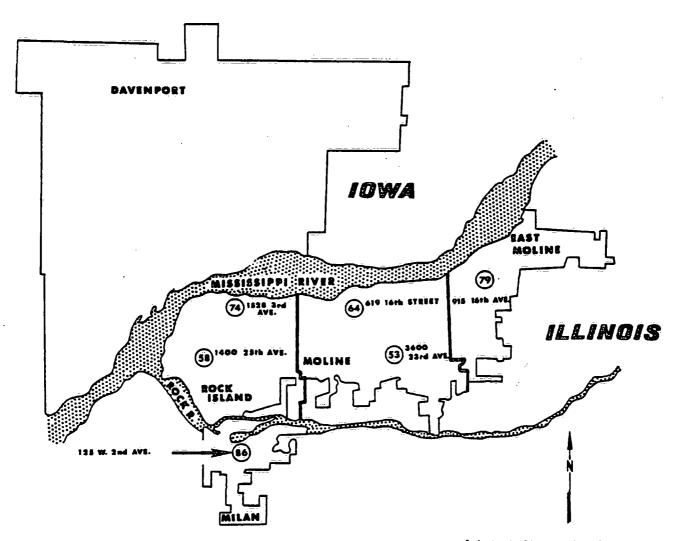
NON-METHANE HYDROCARBONS

Data not available in Illinois portion of this air quality control region.

QUAD-CITY AREA

TOTAL SUSPENDED PARTICULATES ANNUAL GEOMETRIC MEAN

(MICROGRAMS PER CUBIC METER)



1 inch equals approximately 1.4 miles

FIGURE 7

1977 TOTAL SUSPENDED PARTICULATÉS

(MICROGRAMS PER CUBIC METER)

STATION	ADDRESS	NL	MBER AMPLE	OF	HIGHEST SAMPLES				ANNUAL STATISTICS		
		TOTAL	>150 UG/M ³	>260 UG M ³	1st	2 nd	3rd	1,14	GEOMETRIC MEAN	DEVIATION	
ROCK ISLAND COUNTY East Moline Milan Moline Moline (RASN) Moline Rock Island (RASN) Rock Island	915 16th Ave. 125 W. 2nd Ave. 619 16th Ave. 619 16th Ave. 3600 23rd Ave. 1528 3rd Ave. 1400 25th Ave.	59 55 56 5 5 54 32 50	4:62 00 21	0.11000	249 300 330 77 131 171 200	178 169 191 63 126 168 117	169 165 148 53 108 123 110	155 162 137 48 108 115 103	79 86 64 53 74 58	1.56 1.57 1.58 1.51 1.52 1.52	
NHITESIDE COUNTY Rock Falls Sterling	101 12th Ave. 110 W. 5th St.	46 18	0.0	0	140 134	136 125	136 93	111 90	60 •	1.51	

SHORT-TERM TRENDS FOR TOTAL SUSPENDED PARTICULATES

67471611	ADDRESS			ANNUAL	MEAN (ug/M ³)		
STATION	AUUKESS	1971	1972	1973	1974	1975	1976	1977
ROCK ISLAND COUNTY								-
East Moline Milan Moline Moline Rock Island (RASN) Rock Island	915 16th Ave. 125 W. 2nd Ave. 619 16th Ave. 3600 23rd Ave. 1528 3rd Ave. 1400 25th Ave.	- + - 90	96 - 83 - 80 -	87 + + + 81	85 96 71 60 72 70	82 99 80 52 68 61	79 90 81 54 70 61	79 86 64 53 74 58
WHITESIDE COUNTY Rock Falls Sterling	101 12th Ave. 110 W. 5th St.	- -	- 57	- 42	*	* 62	* 71	60 •

SULFUR DIOXIDE

(PARTS PER MILLION)

STATION	ADDRESS	NUMBER OF SAMPLES		HIGHEST SAMPLES (PPM)				ANN STATI			
SIATION	ADDRESS		24 HR	AVGS > 5	24-HR AVGS >.14	151	AVG.	lst	AVG.	MEAN	STD. GEO. DEVIATION
ROCK ISLAND COUNTY											
East Moline Rock Island	915 16th Ave. 1504 3rd Ave.	6552	55	Ų Na	Ö	N4 .068	NA .060	.020 .029	.019 .027	.004	1.92

NA - Not applicable

Did not meet minimum statistical culling criteria (see section 4.1),

Site not in operation during year shown.

1977 NITROGEN DIOXIDE

(PARTS PER MILLION)

STATION ADDRESS		NO. SAM	OF PLES	,	QUART AVERAGE:	ERLY S (PPM)		ANN STATI	UAL STICS
312.101		1 HR	24 HR	lst	2 nd	3rd	4th	ARITH. MEAN	STD. GEO. DEVIATION
ROCK ISLAND COUNTY									
East Moline	915 16th Ave.		56	.026	.033	.028	.023	.027	1.33

OZONE

(PARTS PER MILLION)

		NO. OF SAMPLES					Н	IGHES	T SAN	APLES	(PPM))	
STATION	ADDRESS		80. <		4.00				4116	CF.DS		ANN	UAL
		TOTAL	PPM	MAK	APR	MAT	TOME	JULY	AUG	SEPI	OCT	lst	2nd
ROCK ISLAND COUNTY													
Rock Island	1504 3rd Ave.	5502	56	.052	.064		.088	.100	.086 (1)	.105	.048	.167	.146
						(42)	(3)	(6)	(1)	(4)			

Numbers shown in parenthesis denote the number of samples exceeding .08 ppm in a given month.

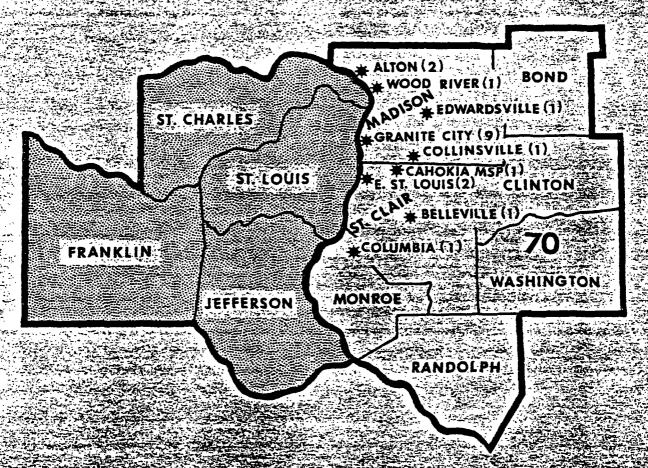
CARBON MONOXIDE

(PARTS PER MILLION)

		NO OF	NUMBER OF	AVERAGES		_	HIGI	4EST		
STATION	ADDRESS	SAMPLES	1 - HR	8 - HR	1-HS	AVE	AGE	8-H	R AVER	AGE
			>35 PPM	> 9 PPM	1 st	2nd	3rd	lst	2 nd	3rd
ROCK ISLAND COUNTY										
Rock Island	1504 3rd Ave.	7270	0	Q	12.2	11.2	10.6	8.9	8.2	6.7

AIR QUALITY CONTROL REGION 70 METROPOLITAN ST. LOUIS INTERSTATE (ILLINOIS-MISSOURI)

A CONTRACTOR OF THE PARTY OF TH



Data for the Missouri portion of this control region can be obtained from:
Missouri Department of Natural Resources.

Division of Environmental Quality,
P.O. Box 176, 117 Commerce Drive,
Jefferson City, Missouri 65101

(314) 751-3241

(The number of sampling sites in each city is shown in parenthesis following the city name.)

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METROPOLITAN ST. LOUIS INTERSTATE (ILLINOIS - MISSOURI) AIR QUALITY CONTROL REGION (AOCR) 70

TOTAL SUSPENDED PARTICULATES

Out of a total of 16 sites having valid annual averages, 13 (81%) were in excess of the annual primary standard. All 9 sites in Granite City, including the two special purpose sites, were above the annual primary standard. The highest annual average in the region, as well as, in the State for 1977 was 186 ug/m³ recorded at 2001 East 20th Street in Granite City. In fact, 7 of the 9 Granite City sites were ranked in the highest ten in the State in 1977. Figures 8 and 9 list the annual means for sites in the St. Louis metro-east area and Granite City, respectively.

Of the 18 sites in the Region, 9 (50%) recorded at least one excursion of the 24-hour primary standard and 6 of those 9 recorded more than one excursion and are in violation of the standard. All of the sites in violation, except one (Wood River), are in Granite City. The site at 2001 East 20th Street in Granite City recorded the most excursions, 16 (15 yiolations). It also recorded the highest 24-hour sample of 592 ug/m^3 .

SULFUR DIOXIDE

None of the six sites at which sulfur dioxide was monitored in this region was above the primary annual standard of .03 ppm. Wood River had the highest average .025 ppm (highest in the State in 1977) followed by 2301 Adams in Granite City, with .023 ppm. Figure 10 is a map of the St. Louis metro-east area listing the annual averages.

Wood River recorded one excursion (no violations) of the 24-hour primary standard of .14 ppm, with a maximum 24-hour average of .194 ppm. This compares with 5 excursions (4 violations) in 1976. There were no excursions of the 3-hour secondary standard of .5 ppm. The highest 3-hour average was .378 ppm recorded in Alton.

NITROGEN DIOXIDE

All three sites having valid annual averages were below the primary annual standard of .05 ppm, with the highest average of .031 ppm being recorded in Granite City.

OZONE

Ozone was monitored at four sites during the entire 1977 ozone season in this AQCR. Wood River had the largest number of excursions of the 1-hour primary standard of .08 ppm in this AQCR and the State for 1977 with 388. Wood River also had the highest 1-hour average in this AQCR with .194 ppm. The distribution of excursions by month for sites in this AQCR was much more uniform than in other areas of the State.

CARBON MONOXIDE

Carbon monoxide data was recorded at three sites during 1977. However, the Granite City data represents sampling by one instrument that was moved in August to 2001 Edison. Thus, a complete year of data was not available at that site. The Edison site in Granite City recorded one excursion of the 8-hour primary standard of 9 ppm (0 violations). The highest 8-hour average was 9.4 ppm recorded at 2001 Edison in Granite City. The highest 1-hour average of 19.0 ppm, which is below the 1-hour standard of 35 ppm, was also recorded at this site.

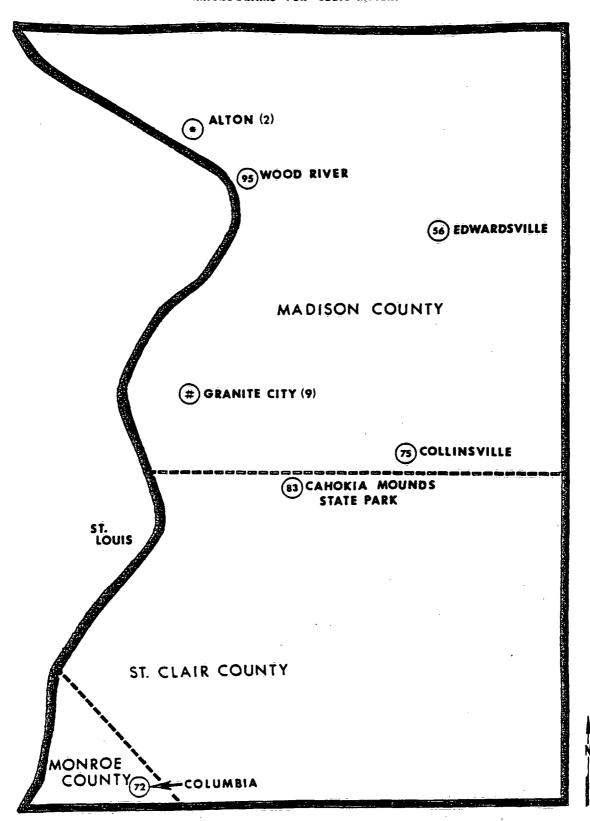
NON-METHANE HYDROCARBONS

Data not available for the Illinois portion of this air quality control region.

ST. LOUIS METRO-EAST

TOTAL SUSPENDED PARTICULATES ANNUAL GEOMETRIC MEAN

(MICROGRAMS PER CUBIC METER)



* Alton - 103 E. 3rd St. - 78 Alton - 2708 Edwards - 71

#See Figure 9 for Granite City Data

FIGURE 8

1 inch equals approximately 4.5 miles

GRANITE CITY

TOTAL SUSPENDED PARTICULATES ANNUAL GEOMETRIC MEAN

(MICROGRAMS PER CUBIC METER)

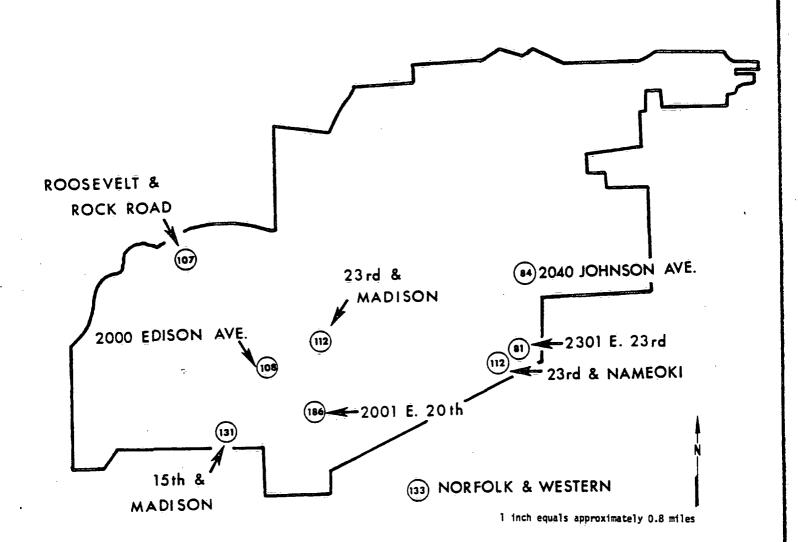
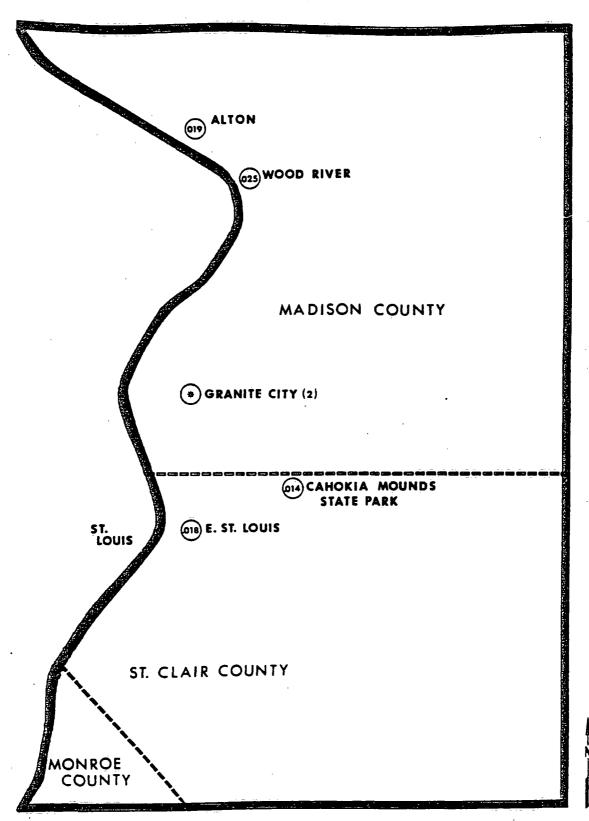


FIGURE 9

ST. LOUIS METRO-EAST

SULFUR DIOXIDE ANNUAL ARITHMETIC MEAN

(PARTS PER MILLION)



Granite City - 2000 Edison - .012 Granite City - 2301 Adams - .023

l inch equals approximately 4.5 miles

1977 TOTAL SUSPENDED PARTICULATES

(MICROGRAMS PER CUBIC METER)

STATION	ADDRESS		MBER AMPLE		HIGHEST SAMPLES				ANNUAL STATISTICS		
		TOTAL	>150 UG/M ³	>260 UG, M ³	lst	2 nd	3rd	4th	GEOMETRIC MEAN	STD. GEO. DEVIATION	
MADISON COUNTY Alton Alton Collinsville Edwardsville Granite City Wood River	103 E. 3rd St. 2708 Edwards 115A W. Main Main & Purcell 2000 Edison 23rd & Madison 3201 E. 23rd 2001 E. 20th 15th & Madison Roosevelt & Rock Rd. 2040 Johnson Ave. Norfolk & Western 23rd & Nameoki 54 N. Walcott	54 46 55 55 59 54 55 54 55 74 68 56	6 3 5 0 13 17 9 34 22 11 4 34 19 10	00000316210652	196 173 175 131 238 385 302	193 163 165 126 231 276 234	187 156 165 125 215 270 222 478 257 230 159 362 341 233	177 133 153 106 193 237 184 469 256 199 256 199 259 340 208	78 71 75 56 108 112 81 186 131 107 84 133 112 95	1.57 1.55 1.48 1.50 1.48 1.72 1.76 1.71 1.54 1.57 1.57 1.57 1.57	
MONROE COUNTY Columbia ST. CLAIR COUNTY	208 S. Rapp	47	4	0	229	200	170	152	72	1.65	
Belleville Cahokia State Park East St. Louis	101 S. Illinois Business Rte. 40 7 Collinsville Ave.	22 77 32	1 8 4	0 0 1	221	210	131 194 163	122 183 161	* 83	1.61	

SHÖRT-TERM TRENDS FOR TOTAL SUSPENDED PARTICULATES

CTATION	ADDRESS	ANNUAL MEAN (ug/m³)						
STATION	ADDRESS	1971	1972	1973	1974	1975	1976	1977
MADISON COUNTY Alton Alton Collinsville Edwardsville Granite City Mood River	103 E. 3rd St. 2708 Edwards 115 A W. Main Main & Purcell 2000 Edison 23rd & Madison 3201 E. 23rd 2001 E. 20th 15th & Madison Roosevelt & Rock Rd. 2040 Johnson Ave. Norfolk & Western 23rd & Nameoki 54 N. Walcott	80 85 78 179 127 123 174 174 - - -	88 67 69 163 124 89 205 200 116	69 - 60 54 143 110 88 202 161 82 - - 79	69 66 53 ** 93 86 158 * 86 -	78 - 68 54 96 105 68 158 138 97 - +	84 - 76 - 58 - 114 - 123 - 83 - 205 - 155 - 111 - 82	78 71 75 56 108 112 81 186 131 107 84 133 112
MONROE COUNTY Columbia ST. CLAIR COUNTY	208 S. Rapp	72	64	51	. 59	47	65	72
Belleville Cahokia State Park East St. Louis	101 S. Illinois Business Rt. 40 7 Collinsville Ave.	84 124 105	81 108 110	63 101 87	73 111 89	63 103 80	77 113 90	83

Bid not meet minimum statistical culling criteria (See Section 4.1)

Special Purpose Site

[·] Site not in operation during year shown.

1977 SULFUR DIOXIDE

(PARTS PER MILLION)

STATION	ADDRESS	N	UMBE SAM	R OF		SA	HIGH MPLE	IEST S (PP	M)	ANN STATI	
31AIIO				3 - HR AVGS >.5		3-HR lse	AVG.	24-HE	AVG.	ARITH. MEAN	STD. GEO. DEVIATION
MADISON COUNTY Alton Granite City Granite City Wood River ST. CLAIR COUNTY	2708 Edwards 2000 Edison 2301 Adams 54 N. Walcott	7729 7750 8350	55 55	0 A 0 0 A 0	0 0 0 1 0	.378 NA .222 .332 NA	.282 NA .197 .315 NA	.123 .031 .139 .194 .042	.071 .028 .105 .129 .038	.019 .012 .023 .025	2.53 2.23 2.58 2.78 2.78 2.78
Cahokia State Park East St. Louis	Business Rte. 40 650 Missouri	8037 8262	56	O O NA	0	.170 .275 NA	.115 .258 NA	.070 .103 .054	.050 .098 .050	.014 .018 .015	2.18 2.45 2.32

NITROGEN DIOXIDE

(PARTS PER MILLION)

STATION	ADDRESS	NO. SAM	OF PLES		QUART AVERAGE	ERLY S (PPM)		ANN STATI	UAL STICS
3121101		1 HR	24 HR	îst	2nd	3rd	4th	ARITH, MEAN	STD. GEO. DEVIATION
MADISON COUNTY Granite City Wood River ST. CLAIR COUNTY	2000 Edison 54 N. Walcott		58 56	.030 .026	.030 .025	. 030 . 022	.032 .021	.031 .024	1.40 1.63
Cahokia State Park East St. Louis	Business Rte. 40 650 Missouri	5793	57	.027 .027	.031 .033	.031	.026	.029	1.85

NA - Not applicable.

⁻ Did not meet minimum statistical culling criteria (See Section 4.1)

1977 OZONE (PARTS PER MILLION)

		NO. SAMI	OF LES		-		Н	IGHES	T SAN	APLES	(PPM)		
STATION	ADDRESS		80. <									ANN	UAL
		TOTAL	PPM	MAR		MAY		JULY		SEPT	OCT	lat	2nd
MADISON COUNTY		The same of											
Alton	2708 Edwards	5468	148	NS	.141 (10)	.133 (44)	.105 (2)	.175 (73)	.136 (8)	.111 (11)	.079	.175	.159
Hood River	54 N. Walcott	8313	388	.077	.097 (10)	.163 (111)	.194 (73)	.186 (133)	. 129 (36)		.088 (3)	.194	.187
ST. CLAIR COUNTY													
Cahokia Mounds	Business Rt. 40	7301	257	.077		.137 (108)		.121 (68)		.109 (12)	.061	.137	.136
East St. Louis	650 Missourt	7555	137	.049	.089 (6)			.130 (43)		.091 (3)	.046	.147	.144
									l				

Numbers shown in parenthesis denote the number of samples exceeding .08 ppm in a given month.

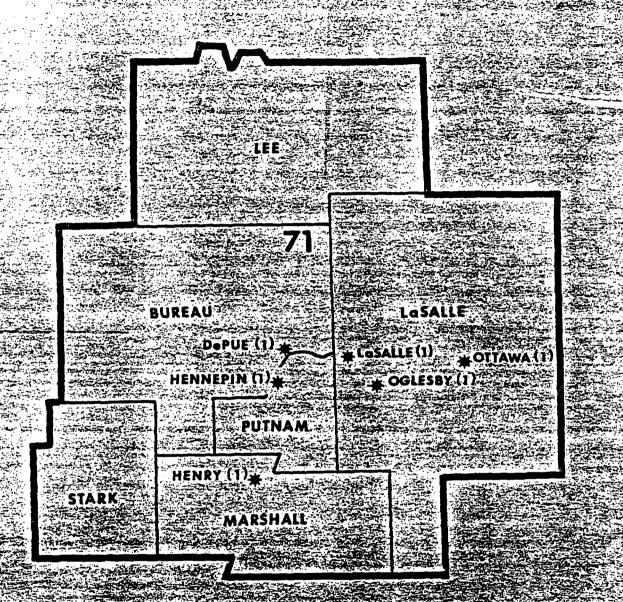
CARBON MONOXIDE

(PARTS PER MILLION)

		NO OF	NUMBER OF	AVERAGES	ì		HIGI	HEST		
STATION	ADDRESS	SAMPLES	1 - HR.	8 - HR	1-H	AVE	AGE	8 - H	R AVER	AGE
			> 35 PPM	>9 PPM	1 st	2nd	3 rd	lst	2 nd	3 rd
MADISON COUNTY										
Granite City Wood River	2001 Edison 54 N. Halcott	2591 7615	0	î 0	19.0 9.0	15.6 8.0	13.8 7.8	9.4 5.9	9.0 4.9	8.4 4.4
ST. CLAIR COUNTY Cahokila Mounds	Business Rt. 40	7673	0	0	11.5	6.6	6.1	5.6	5.1	5.0

NS - No samples

AIR QUALITY CONTROL REGION 71 NORTH CENTRAL ILLINOIS INTRASTATE



(The number of sampling sites in each city is shown in parenthesis following the city name.)

NORTH CENTRAL ILLINOIS INTRASTATE AIR QUALITY CONTROL REGION (AQCR) 71

TOTAL SUSPENDED PARTICULATES

Oglesby with an annual mean of 91 ug/m³, was the only site of the four having valid annual averages that was above the primary annual standard of 75 ug/m³. The other three sites were below the annual secondary standard of 60 ug/m³.

A total of four sites (three of them special purpose) monitored for TSP in Oglesby during at least part of the year. Three of these sites recorded at least one excursion of the 24-hour primary standard and two sites, 217 Portland and 230 Portland, recorded 11 excursions (10 violations) and 4 excursions (3 violations) respectively. Outside of Oglesby, DePue recorded one excursion (no violations). The maximum 24-hour sample was 517 ug/m³ recorded at 230 Portland in Oglesby.

SULFUR DIOXIDE

All three sites had annual means well below the primary annual standard of .03 ppm. There were no excursions of either the 3-hour or 24-hour standards recorded at the sites listed. However, industrial data showed excursions of both the 3-hour standard and 24-hour standard in 1977 (see section 6.0).

NITROGEN DIOXIDE

All three sites for which nitrogen dioxide data was available had annual averages well below the primary annual standard of .05 ppm, with Henry having the highest average with .020 ppm.

OZONE

The monitoring site in LaSalle recorded 161 excursions of the 1-hour primary standard of .08 ppm compared with only 51 excursions in 1976. Over 75% of the excursions occurred in May and July. The maximum 1-hour average was .151 ppm while in 1976 the maximum was .106 ppm.

CARBON MONOXIDE, NON-METHANE HYDROCARBONS

Data not available for this air quality control region.

1977 TOTAL SUSPENDED PARTICULATES

(MICROGRAMS PER CUBIC METER)

STATION	ADDRESS		MBER AMPLE			HIGH SAM	IEST		ANN STATI	UAL STICS
		TOTAL	>150 UG/M ³	>260 UG/M ³	lst	2 nd	3rd		GEOMETRIC MEAN	STD GEO. DEVIATION
<u>BUREAU COUNTY</u> DePue	1401 Marquette	51	2	1	267	156	102	96	58	1.61
LA SALLE COUNTY Oglesby1 Oglesby1 Oglesby1 Oglesby1	217 Portland 230 Portland 110 W. 2nd St. Maple & Watson	116 55 55 56 52	32 13 0	11 4 0	430 517 123 270	412 443 112 231	396 328 101 216	395 325 100 205	91 *	2.17
Ottawa PUTNAM COUNTY	211 E. Main	52	1	Ô	169	137	103	103	54	1.47
Kennepin	5th & High	52	1	0	194	117	114	108	56	1.63

SHORT-TERM TRENDS FOR TOTAL SUSPENDED PARTICULATES

CTATION	ADDRESS			ANNUAL	MEAN (ug/m³)		
STATION		1971	1972	1973	1974	1975	1976	1977
BUREAU COUNTY DePue	1401 Marquette	80	68	65	61	58	63	58
LA SALLE COUNTY Oglesby1 Oglesby1 Oglesby1 Oglesby1 Oglesby1 Ottawa	217 Portland 230 Portland 110 W. 2nd St. Maple & Watson 211 E. Main	1 1 1		:	• • • •	- - - 55	÷ - - 64	91 + + 54
<u>PUTNAM COUNTY</u> Hennep1n	5th & High	54	55	46	48	48	53	56

⁻ Site not in eperation during year shown.

Did not meet minimum statistical culling criteria (see section 4.1)

¹ Special Purpose Site

1977 SULFUR DIOXIDE

(PARTS PER MILLION)

STATION	ADDRESS	N	IUMBI SAM	R OI PLES		SA	HIGI MPLE	IEST S (PP		ANN STATI	
			24 HR	>.5	AVGS	lst			L AVG.	ARITH. MEAN	STD. GEO. DEVIATION
<u>LA SALLE COUNTY</u> LaSalle Ottawa	541 Chartres 211 E. Main	8122		O NA NA	000	.144 NA NA	.086 NA NA	.061 .015 .032	.038 .011 .010	.009 .004 .004	1.82 1.73 1.88
MARSHALL COUNTY Henry	Route 29		44	NA.	0	ŇΑ	NA	.048		.007	2.55

NITROGEN DIOXIDE

(PARTS PER MILLION)

STATION	ADDRESS	NO.	OF PLES		QUART AVERAGE:	ERLY S (PPM)		ANN STATI	UAL STICS
			24 HR		2nd	3rd	4th	ARITH. MEAN	STD. GEO. DEVIATION
LA SALLE COUNTY LaSalle Ottawa	541 Chartres 211 E. Main		49 51	.016 .015	.014 .014	.016 .012	.018 .011	.016 .013	1.43 1.81
MARSHALL COUNTY Henry	Route 29		45	.020	.017	.018	.028	.020	1.93

ÖZÖNE

(PARTS PER MILLION)

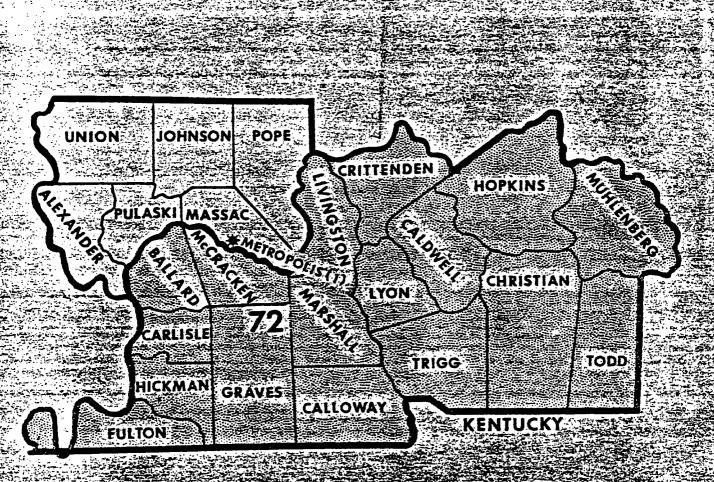
7		NO. SAMI					H	IGHES	T SAN	APLES	(PPM)		
STATION	ADDRESS	TOTAL	>.08	MAR	APP	MAY	III NE		AUG	SEPT	OCT	ANA	UAL
	-1							300	700		001)st	2nd
LA SALLE COUNTY													
LaSaile	541 Chartres	8285	161	.055	.075	.151 (79)	.113 (37)	.126 (44)		.091 (1)	.050	.151	.131

Numbers shown in parenthosis denote the number of samples exceeding .08 ppm in a given month.

NA - Not applicable.

^{*} Did not meet minimum statistical culling critoria (See Section 4.1)

AIR QUALITY CONTROL REGION 72 PADUCAH-CAIRO INTERSTATE (KENTUCKY-ILLINOIS)



(The number of sampling sites in each city is shown in parenthesis following the city name.)

PADUCAH - CAIRO INTERSTATE (KENTUCKY - ILLINOIS) AIR QUALITY CONTROL REGION (AQCR) 72

TOTAL SUSPENDED PARTICULATES

The only site in this Region, Metropolis, did not have a sufficient number of samples for a valid annual mean. Industrial data indicated that annual means in Metropolis were less than the annual secondary standard of 60 ug/m 3 (see section 6.0). The State site in Metropolis did record one excursion (0 violation) of the 24-hour primary standard of 260 ug/m 3 with a maximum value of 350 ug/m 3 .

SULFUR DIOXIDE

The site in Metropolis did not have sufficient data for a valid annual average. There were no excursions of the 24-hour primary standard of .14 ppm at this site. The maximum 24-hour average was .135 ppm. In addition, industrial data showed that excursions of both the 24-hour primary and 3-hour secondary standards occurred in this AQCR in 1977 (see section 6.0).

NITROGEN DIOXIDE

The site in Metropolis did not record sufficient data to obtain a valid annual average.

OZONE, CARBON MONOXIDE, NON-METHANE HYDROCARBONS

Data not available in Illinois portion of this air quality control region.

1977 TOTAL SUSPENDED PARTICULATES

(MICROGRAMS PER CUBIC METER)

STATION	ADDRESS	NU	MBER AMPLE	OF		HIGH SAMI	1EST	·· ·	ANN STATI	
		TOTAL	>150 UG/M ³	>260 UG/M ³		2nd	3rd	4th	GEOMETRIC MEAN	STD GEO. DEVIATION
MASSAC COUNTY										
Metropolis	Massac County Hospital	21	7	1	350	217	213	195	•	

SHORT-TERM TRENDS FOR TOTAL SUSPENDED PARTICULATES

STATION	ADDRESS			ANNUAL	MEAN (UG/M ³)		<u> </u>
 	ADDRESS	1971	1972	1973	1974	1975	1976	1977
MASSAC COUNTY								
Metropolis	Massac County Hospital	•	-	.	•	53	•	

SULFUR DIOXIDE

(PARTS PER MILLION)

STATION	ADDRESS	UMBE SAM	R OI PLES		SA	HIGH MPLE		M)	ANN STATI	
Jianon		 24 HR	3 - HR AVGS >.5	24-HR AVGS >.14	lst	AVG.	24-Hi	AVG.	ARITH. MEAN	STD. GEO. DEVIATION
MASSAC COUNTY								:		
Metropolis	Massac County Hospital	26	NA	0	ŇA	NA	. 135	.098	*	

NITROGEN DIOXIDE

(PARTS PER MILLION)

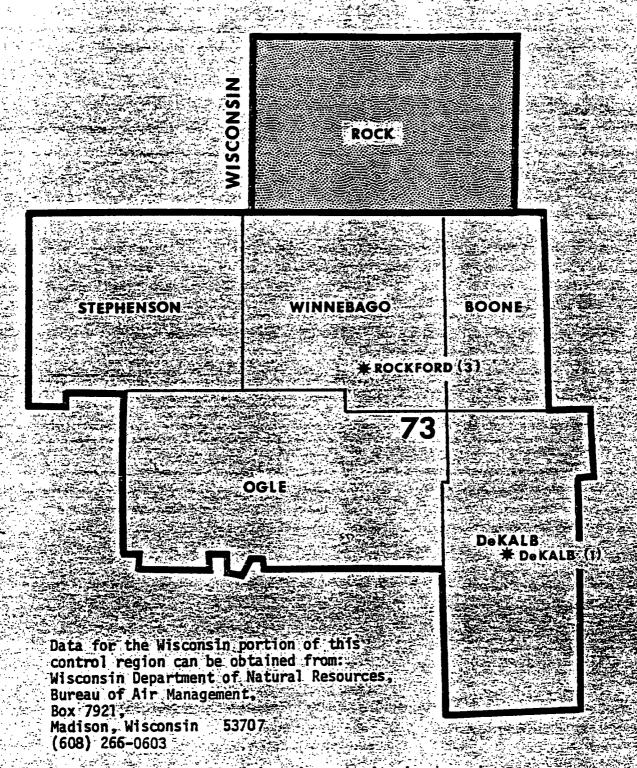
STATION	ADDRESS	NO. SAM	OF PLES		QUART AVERAGE:	ERLY S(PPM)		ANN STATI	UAL STICS
		1 HR	24 HR	îst	2 nd	3rd	4th	ARITH. MEAN	STD. GEO. DEVIATION
MASSAC COUNTY								·	
Metropolis	Massac County Hospital		25	.018	*	.011	•	*	

⁻ Site not in operation during year shown.

NA - Not applicable

Did not meet minimum statistical culling criteria (see section 4.1)

AIR QUALITY CONTROL REGION 73 ROCKFORD-JANESVILLE-BELOIT INTERSTATE (ILLINOIS-WISCONSIN)



(The number of sampling sites in each city is shown in parenthesis following the city name.)

ROCKFORD - JANESVILLE - BELOIT INTERSTATE (ILLINOIS - WISCONSIN) AIR QUALITY CONTROL REGION (AQCR) 73

TOTAL SUSPENDED PARTICULATES

All three sites in this Region had annual geometric means below the annual secondary standard of 60 ug/m^3 . The maximum was 56 ug/m^3 recorded in DeKalb. The site in DeKalb also recorded one excursion (no violations) of the 24-hour primary standard with a value of 435 ug/m^3 .

SULFUR DIOXIDE

The only site in this Region, Rockford, recorded an annual mean of .011 ppm, well below the primary annual standard of .03 ppm. Additionally, there were no excursions of the 24-hour primary or the 3-hour secondary standard.

NITROGEN DIOXIDE

The only site in this Region, Rockford, recorded an annual mean of .020 ppm, well below the annual primary standard of .05 ppm.

OZONE

The monitoring site in DeKalb recorded 180 excursions of the 1-hour primary standard of .08 ppm. This was the most excursions measured in this Region. The highest 1-hour average was .172 ppm, also measured in DeKalb. The highest 1-hour average recorded at Rockford was .123 ppm.

CARBON MONOXIDE, NON-METHANE HYDROCARBONS

Data not available for the Illinois portion of this air quality control region.

1977 TOTAL SUSPENDED PARTICULATES

(MICROGRAMS PER CUBIC METER)

STATION	ADDRESS		MBER AMPLE			HIGH			ANN STATI	
		TOTAL	>150 UG/M ³	>260 UG, M ³	lst	2 nd	3rd	4th	GEOMETRIC MEAN	STD GEO. DEVIATION
<u>DeKALB COUNTY</u> DeKalb	200 S. 4th	43	2	1	435	179	103	91	56	1.67
WINNEBAGO COUNTY Rockford Rockford	2525 Ohio 126 S. 1st St.	51 40	1	0 0	187 143	149 128	90 103	7 9 102	44 55	1.56 1.56

SHORT-TERM TRENDS FOR TOTAL SUSPENDED PARTICULATES

CTATION	ADDRESS			ANNUAL	MEAN (UG/M ³)		
STATION	ADDRESS	1971	1972	1973	1974	1975	1976	1977
DeKALB COUNTY DeKalb	200 S. 4th	94	74	65	65	65	•	56
<u>WINNEBAGO COUNTY</u> Rockford Rockford	2525 Ohio 126 S. 1st St.	71 *	72 •	63 54	* 50	41 51	53 60	44 55

SULFUR DIOXIDE

(PARTS PER MILLION)

STATION	ADDRESS	N	UMBE SAM	R OF		SA	HIGH MPLE	IEST S (PPI	M)	ANN STATI	
3721101		1 HR	24 HR	3 - HR AVGS >.5	24-HR AVGS > 14	3-HR lst	AVG.		AVG.	ARITH. MEAN	STD. GEO. DEVIATION
WINNEBAGO COUNTY Rockford	1528 18th Ave.	7822	42	O NA	00	.166 NA	.087 NA	.076 .026		.011 .004	1.99 2.09

NA - Not applicable

• - Did not meet minimum statistical culling criteria (see section 4.1).

1977 NITROGEN DIOXIDE

(PARTS PER MILLION)

STATION	ADDRESS	NO. SAM	OF PLES		QUART VERAGE:	ERLY 5 (PPM)		ANN	UAL STICS
		1 HR	24 HR	lst	2nd	3rd	4th	ARITH. MEAN	STD. GEQ. DEVIATION
WINNEBAGO COUNTY									
Rockford	1528 18th Ave.		47	.019	.021	.021	.020	.020	1.44

OZONE

(PARTS PER MILLION)

		NO. SAME	OF LES					IGHES	T SAN	APLES	(PPM)		
STATION	ADDRESS	TOTAL	> .08	MAR	APR	MAY	JUNE	וענא	AUG	SEPT	ОСТ	ANN	
												1st	2nd
DEKALB COUNTY DEKalb ¹	Faraday Hall	4079	180	NS	หร	.172 (118)	.124 (37)	.105 (25)	.057	.072	.035	.172	.165
WINNEBAGO COUNTY Rockford	1528 18th Avenue	8202	70	.054	.079	.123 (29)	(16)	.113 (25)	.080	.063	.056	.123	.120

Numbers shown in parenthesis denote the number of samples exceeding .08 ppm in a given month

Special Purpose Site

AIR QUALITY CONTROL REGION 74 SESSION SOUTHEAST ILLINOIS INTRASTATE



(The number of sampling sites in each city is shown in parenthesis following the city name.)

SOUTHEAST ILLINOIS INTRASTATE AIR QUALITY CONTROL REGION (AQCR) 74

TOTAL SUSPENDED PARTICULATES

The only site in this Region above the annual primary standard of 75 ug/m^3 was Carbondale, with an average of 77 ug/m^3 . The other three sites were either equal to or less than the annual secondary of 60 ug/m^3 . No excursions of the 24-hour primary standard were recorded during 1977.

SULFUR DIOXIDE

Neither of the two sites, with valid annual averages in this Region, was above the primary annual standard; Marion had the highest average at .014 ppm. The short-term standards were not exceeded at either site. The highest 24-hour average was .115 ppm recorded in Marion.

NITROGEN DIOXIDE

The two sites (Carbondale and Marion) recording valid annual averages in this Region were well below the annual primary standard of .05 ppm. The annual and quarterly averages at these sites were nearly identical, with the annual average at Carbondale being .016 ppm and at Marion .015 ppm.

OZONE

The monitoring site in Marion recorded 188 excursions of the 1-hour primary standard of .08 ppm in 1977 compared with only 9 in 1976. The highest 1-hour average was .179 ppm. In 1976 the maximum value was .117 ppm.

CARBON MONOXIDE, NON-METHANE HYDROCARBONS

Data not available for this air quality control region.

1977 TOTAL SUSPENDED PARTICULATES

(MICROGRAMS PER CUBIC METER)

STATION	ADDRESS		IMBER AMPLE			HIGI SAMI			ANN STATI	
		TOTAL	>150 UG/M3	>260 UG M ³	lst	2 nd	3rd	4 th	GEOMETRIC MEAN	STD GEO.
EFFINGHAM COUNTY Effingham	1015 S. Úł11ow	36	1	0	158	138	127	119	57	1.60
JACKSON COUNTY Carbondale	306 W. Main St.	33	2	0	251	186	129	121	77	1.50
JEFFERSON COUNTY Mt. Vernon	601 N. 18th St.	51	2	0	179	163	121	121	59	1.67
<u>WILL IAMSON COUNTY</u> Marion	2209 W. Main St.	49	2	0	196	171	140	136	60	1.65

SHORT-TERM TRENDS FOR TOTAL SUSPENDED PARTICULATES

	4 = 0.0755			ANNUAL	MEAN (ug/m³)		
STATION	ADDRESS	1971	1972	1973	1974	1975	1976	1977
<u>EFFINGHAM COUNTY</u> Effingham	1015 S. Willow	•	-	•	•	58	59	57
JACKSON COUNTY Carbondale JEFFERSON COUNTY	306 W. Main St.	-	-	-	-	-	-	77
Mt. Vernon	601 M. 18th St.	-	-	-	-	•	58	59
<u>WILLIAMSON COUNTY</u> Marion	2209 W. Main St.		_		*	46	50	60

⁻ Site not in operation during year shown.

Did not meet minimum statistical culling criteria (see section 4-1)

1977 SULFUR DIOXIDE

(PARTS PER MILLION)

STATION	ADDRESS	Ñ	UMBI SAM	R OI PLES			HIGH MPLE	(EST	M)	ANN	
			24 HR	3 - HR AVGS > 5	AVGS >.14	lst	AVG.		AVG.	ARITH. MEAN	STD. GEO. DEVIATION
EFFINGHAM COUNTY Effingham JACKSON COUNTY	1015 S. Willow		43	NA	0	NA	ŅĀ	. 028	.019	•	
Carbondale	306 W. Main		32	ŅA	0	NA	NA	.033	. 033	.009	2.46
Marion	2209 W. Main	7973	53	O NA	0	. 201 NA	. 152 NA	.046		.014 .004	2.0 9 1.98

NITROGEN DIOXIDE

(PARTS PER MILLION)

STATION	ADDRESS	NO. SAM	OF PLES		QUART AVERAGE:	ERLY S (PPM)		ANN STATI	UAL 3
		1 HR	24 HR	lst	2nd	3rd	4th	ARITH. MEAN	STD. GEO. DEVIATION
EFFINGHAM COUNTY EFFINGHAM ACKSON COUNTY	1015 S. W111ow		45	.014	.013	.014	•	•	
Carbondale WILLIAMSON COUNTY	306 W. Main		32	.017	.012	.017	.016	.016	1.67
Marion	2209 W. Main		55	.015	.016	. 015	-014	.015	1.84

OZONE

(PARTS PER MILLION)

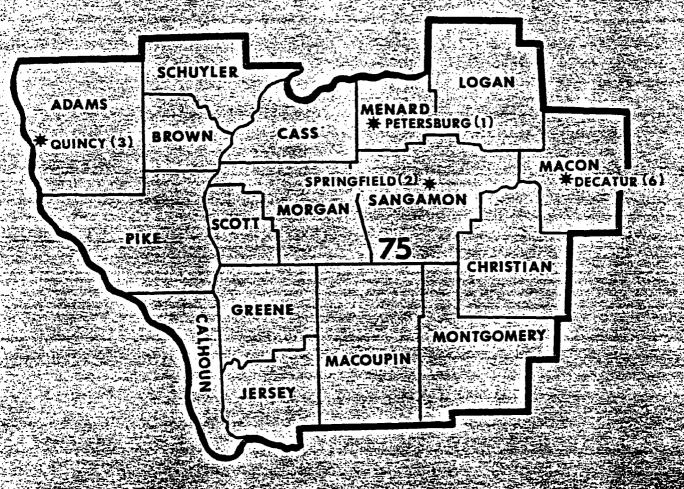
		NO. SAM	OF LES				Н	IGHES	T SAN	IPLES	(PPM)		
STATION	ADDRESS	TOTAL	80. < Mqq	MAR	APŘ	MAY	JUNE		اـــــــــــــــــــــــــــــــــــــ	SEPT	ОСТ	ANN 1st	UAL
WILLIAMSON COUNTY Marton	2209 W. Main St.	6418	188	.072	.088 (7)	.097	. 103 (39)	.179 (98)	. 102 (22)	.061	.068	. 179	.157

NA - Not applicable.

Numbers shown in parenthesis denote the number of samples exceeding .C8 pam in a given month

^{📍 -} Did not meet minimum statistical culling criteria (See Section 4.1.)

AIR QUALITY CONTROL REGION 75



(The number of sampling sites in each city is shown in parenthesis following the city name.)

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WEST CËNTRAL ILLINOIS INTRASTATE AIR QUALITY CONTRÔL REGION (AQCR) 75

TOTAL SUSPENDED PARTICULATES

In this Region seven sites had valid annual averages. Two (both in Decatur) were above the primary annual standard of 75 ug/m^3 with the highest being at Jasper and Orchard with an annual mean of 101 ug/m^3 . The same two sites in Decatur were also the only sites to record excursions of the 24-hour primary standard of 260 ug/m^3 . The site at 22nd and Geddes recorded one excursion (no violations) and the site at Jasper and Orchard recorded four excursions (3 violations). Figure 11 lists the annual geometric means for sites in Decatur.

SULFUR DIOXIDE

There were no excursions of the primary or secondary standards at any of the monitoring sites in this Region during 1977. The special purpose site at 712 South Dirksen in Springfield recorded the highest annual mean, 24-hour average, and 3-hour average in this region with values of .016 ppm, .081 ppm and .278 ppm respectively.

NITROGEN DIOXIDE

All three sites recorded annual averages well below the primary annual standard of .05 ppm. Springfield had the highest average at .023 ppm.

OZONE

All three monitoring sites in this Region recorded more than 100 excursions of the 1-hour primary standard of .08 ppm; Quincy had the most with 144. Springfield recorded the highest 1-hour average with a value of .160 ppm. All three sites recorded a significantly larger number of excursions in 1977 than in 1976.

CARBON MONOXIDE

The monitoring site in Springfield did not record excursions of either the 1-hour standard of 35 ppm or the 8-hour standard of 9 ppm. The highest 1-hour average recorded was 13.2 ppm and the highest 8-hour average was 5.1 ppm.

NON-METHANE HYDROCARBONS

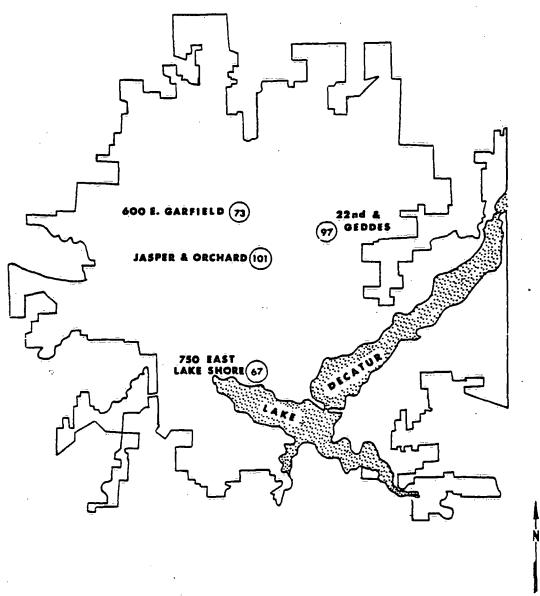
Out of a total of 286 valid 6-9 a.m. averages collected at Springfield during the year, 117 (41%) were in excess of the 0.24 standard. The highest 6-9 a.m. average was 1.4 ppm.

PH:b1/sp/2667/1-14

DECATUR

TOTAL SUSPENDED PARTICULATES ANNUAL GEOMETRIC MEAN

(MICROGRAMS PER CUBIC METER)



1 inch equals approximately 1.4 miles

FIGURE 11

1977 TOTAL SUSPENDED PARTICULATES

(MICROGRAMS PER CUBIC METER)

STATION	ADDRESS		MBER AMPLE			HIGI SAM		~ <u>~~~</u> X:1	ANA	IUAL STICS
 		TOTAL	>150 UG/M3	>260 UG/ M ³	lst	2 nd	3rd	4th	GEOMETRIC MEAN	STD GEO. DEVIATION
ADAMS COUNTY Quincy Quincy	9th and Vermont Sewage Plant	47 44	0	00	136 228	133 165	111 158	104 148	57	1.69
MACON COUNTY Decatur Decatur Decatur Decatur Decatur Decaturl Decatur1	22nd and Geddes 600 East Garfield Jasper and Orchard 750 East Lake Shore 24th and Locust 1735 East Condit	54 57 49 47 26 28	13 5 9 2 5 7	104000	285 254 293 188 234 232	238 191 288 181 163 201	212 179 276 149 158 169	198 178 262 123 155 169	97 73 101 67	1.72 1.72 1.65 1.66
MENARD COUNTY Petersburg	7th and Jackson	55	1	0	152	141	128	125	58	1.65
SANGAMON COUNTY Springfield (RASN) Springfield	8th and Mon ro e 224 West Adams	6 56	0	0	108 206	67 185	55 153	44 150	72	1.54

SHORT-TERM TRENDS FOR TOTAL SUSPENDED PARTICULATES

STATION		ANNUAL MEAN (ug/m³)								
	ADDRESS	1971	1972	1973	1974	1975	1976	1977		
ADAMS COUNTY Quincy Quincy MACON COUNTY Decatur Decatur Decatur Decatur Decatur Decatur Decatur	9th & Vermont Sewage Plant 22nd & Geddes 600 E. Garfield Jasper & Orchard 750 E. Lake Shore Drive 24th & Locust	96 85 105 - -	108 96 81 83 - -	89 112 65 -	57 81 98 60 - -	61 61 105 66 - -	122 81 -	97 73 101 67		
Decatur ¹ MENARD COUNTY Petersburg SANGAMON COUNTY Springfield Springfield (RASN)	1735 E. Condit 7th & Jackson 224 W. Adams 8th & Monroe	-	66 86 -	67 64	59 66	57 70	65 85	58 72		

⁻ Site not in operation during year shown.

Did not most minimum statistical culling criteria (see section 4.1)

Special Purpose Site

1977 SULFUR DIOXIDE

(PARTS PER MILLION)

STATION	ADDRESS	NUMBER OF SAMPLES			HIGHEST SAMPLES (PPM)				ANNUAL STATISTICS		
		1 HR	24 HR	3 - HR AVGS > . 5	24-HR AVGS > 14	وعصوا	2nd		R. AVG.	MEAN DEV	STD. GEO. DEVIATION
ADAMS COUNTY Quincy Quincy MACON COUNTY	9th & Vermont 18th & Elm	7972	40	O NA	00	.143 NA	.132 NA	.050 .020	.049 .018	.009 .006	2.45 2.19
Decatur Decatur SANGAMON COUNTY	2760 N. 22nd St. Franklin & Wood	8015	59	O NA	00	. 188 NA	. 174 NA	.079 .015	.077 .013	.013 .004	2.38 1.81
Springfield Springfield ¹	224 W. Adams 712 S. Dirksen	7971 7734	59	0 % 0	000	.240 NA .278	.165 NA .222	.065 .073 .081	.055 .044 .072	.010 .007 .016	2.39 2.53 3.11

NITROGEN DIOXIDE (PARTS PER MILLION)

STATION	ADDRESS	NO. OF SAMPLES		QUARTERLY AVERAGES (PPM)				ANNUAL STATISTICS	
			24 HR		2 nd	3rd	4th	ARITH. MEAN	STD. GEO. DEVIATION
ADAMS COUNTY -	lBth & Elm		41	.016	.018	.015	.013	.ö15	1.44
MACON COUNTY Decatur SANGAMON COUNTY	Franklin & Wood		59	.01 <u>9</u>	.019	.021	.020	.020	1.27
Springfield	224 W. Adams	8159	60	.021 .018	.024 .017	.023 .018	.025 .017	.023 .017	1.97 1.34

1977 OZONE (PARTS PER MILLION)

		NO. SAMI	OF PLES				Н	IGHES	T SAA	APLES	(PPM)		San Miles	
STATION	ADDRESS	Asoci	>.08 OTAL PPM									ANN	UAL	
	<u> </u>	TOTAL		MAR	APR	MAY	TUNE			SEPT	ОСТ	lst	2nd	
ADAMS COUNTY Quincy MACON COUNTY	·	7845	144	.055	.074	.122 (54)	.125 (22)	. 121 (44)	.135 (19)	.088 (5)	.067	.135	.129	
Decatur <u>SANGAMON COUNTY</u>	2760 N. 22nd St.	6164	102	.072	.088 (5)	.119 (46)	.115 (14)	.120 (35)	.073	.098 (2)	072	.120	.119	
Springfield	224 W. Adams	7391	136	.055	L	.129 (48)	.088 (6)	.160 (49)	.101 (8)	101 (7)	083 (2)	.160	.140	

CARBON MONOXIDE

(PARTS PER MILLION)

		NO OF	NUMBER OF	AVERAGES			HIGI	HEST		li de la companya de
STATION	ADDRESS	SAMPLES	1 - HR > 35 PPM	8 - HR > 9 PPM	1 - HS		AGE	8-H	R AVER	AGE
					1 st	2nd	3rd	lst_	2 nd	3rd
SANGAMON COUNTY										
Springfield	224 W. Adams	7777	0	0 .	13.3	9.2	8.1	5.1	4.ï	3.8
				and the second		· · · · ·				

NON - METHANE HYDROCARBONS

(PARTS PER MILLION)

	NO AVE	OF RAGES				Н		ST AVE		S (PPI	A)				
STATION	ADDRESS	TOTAL 6-9am	6-9cm	JAN	FEB	MAR			JUNE	Ţ.	AUG	SEPT	∞т	NOV	DEC
<u>SANGAMON_COUNTY</u> Springfield	224 W. Adams	286	117					0.6	0.3	0.2	0.0				
Springi leta	224 M. Addins		11/	<u></u> ,	1.2	U.6	0.6	0.6	υ.3	0.3	0.8	0.7	1.4	0.4	0.1

6.0 INDUSTRIAL MONITORING DATA

6.0 INDUSTRIAL MONITORING DATA

The majority of the data presented in this Annual Report has been collected in the statewide monitoring network operated by the State, local agencies and the USEPA. A somewhat recent growth in the number of industrial monitoring sites has made the consideration of these networks an important factor in presenting a complete air quality profile for Illinois. A directory of the industrial monitoring sites which report their data to the IEPA can be found in Section 3.2b. In the coming year, an increased emphasis will be placed on both obtaining industrial monitoring data on a routine basis and performing periodic quality assurance inspections. Data has been summarized in this section for total suspended particulates and sulfur dioxide. These tables summarize data which was readily available at the time of the report but does not constitute all of the industrial data submitted to the IEPA. A computerized industrial data base is being developed to efficiently process industrial data and provide timely summaries.

6.1 TOTAL SUSPENDED PARTICULATE

Data from the four sites, with valid annual averages, show the geometric means to be below the secondary annual standard of $60~\text{ug/m}^3$. If these sites were ranked with the statewide network, they would have ranged from 94-123. The factors involved in the selection of a site which is designed to measure the impact from a limited sample of sources, often results in a relatively low annual mean. In the case of the sites shown here, it can be seen that the short-term 24~hour samples are all below the short-term primary standard, although all but one site is in violation of the secondary short-term standard.

6.2 SULFUR DIOXIDE

Several sulfur dioxide monitoring networks are currently in operation in the vicinity of large power plants. The only exception in this report is the two station network operated near the Mobil Chemical Plant in DePue. Commonwealth Edison (Com. Ed.) and the Central Illinois Light Company (CILCO) have a thirteen station network operating in the vicinity of Com. Ed. - Powerton Plant and CILCO - Edwards Plant in the Peoria - Pekin area. As can be seen from the data, no violations of the sulfur dioxide standards have been measured although one three-hour excursion (.504 ppm) was measured on July 23, 1977.

The two Waukegan monitors are the remnant of a ten station network which operated in the vicinity of the Com. Ed. - Waukegan Power Station from 1975 - 1977. The values reported in 1977 show no violations of any sulfur dioxide standard.

The Mobil Chemical Company in DePue operates a two-station sulfur dioxide monitoring network. The two 24-hour excursions reported from one site occurred during the severe cold weather of January 26 - 28, 1977 during which time production equipment at the plant malfunctioned due to the weather conditions.

The Tennessee Valley Authority (TVA) operates fourteen monitoring sites near its Shawnee Steam Plant located near Paducah, Kentucky. Six of these sites are located in Illinois. Although there are other sources of sulfur dioxide located in the area, the violations recorded at these sites can be related to the operation of the Shawnee Plant. An effort is currently underway at TVA to achieve compliance with the air quality standards. This will be accomplished by the construction of two 800 foot tall stacks (already complete) combined with a sulfur dioxide emission reduction program.

The last network shown in the summary tables is operated in the vicinity of the Com. Ed. - Kincaid Power Station. The data collected to date shows all values well below applicable standards.

Increased efforts in the coming year should result in an industrial data base for 1978 which would include well over 100 total suspended particulate and 100 sulfur dioxide sites. Data from these sites will provide vital information in areas which do not receive intensive monitoring in the statewide network. Our sincere thanks are extended to the following companies for their assistance and cooperation in making these data available:

Commonwealth Edison Company Central Illinois Light Company Tennessee Valley Authority Mobil Chemical Company

1977
SULFUR DIOXIDE IN EXCESS OF THE PRIMARY (24-HOUR)
AND SECONDARY (3-HOUR) SHORT TERM STANDARDS*

STATION	ADDRESS	DATE	AVERAGING TIME	NUMBER [†] OF EXCURSIONS	TIME PERIOD	MAXIMUM AVERAGE (PPM)
65 BURLINGTON-KĒOKUK I	NTERSTATE (IOWA - ILL.)					
State Hospital	Peoria Co Com. Ed./Cilco	July 23	3-Hour	1	0900-1200	504
71 NORTH CENTRAL ILLIN	OIS INTRASTATE					
DePue - SM Plant	Bureau Co Mobil Chemical	October 22 October 21-23 November 4-5	3-Hour 24-Hour 24-Hour	1	1900-2300 2000-1300 0800-1600	.512 .205 .179
DePue - White City	Bureau Co Mobil Chemical	January 28-29 January 30-31	24-Hour 24-Hour	1	1100-1900 0900-1900	.157 .162
72 PADUCAH-CAIRO INTÉR	STATE (KY ILL.)					e direction of the second
Station 10	Massac County - TVA	February 22 February 22 April 28	3-Hour 24-Hour 24-Hour	2 1	0600-1300 0000-2400 0000-2400	1.13 0.27 0.20
Station 11	Massac County - TVA	March 18	3 -Hour	1	0500-0800	0.70
Station 16	Massac County - TVA	June 2	3-Hour	1	0900-1200	0.57
.Station 18	Massac County - TVA	February 24 February 24-25 February 24 March 18	3-Hour 3-Hour 24-Hour 3-Hour	1	1500-1800 2200-0100 0000-2400 0200-0500	0.53 0.51 0.22 0.51
Station 19	Massac County - TVA	February 22-23	3-Hour	Ì	2300-0300	0.62

^{*}The 24-Hour Primary Standard is 0.14 parts per million; the 3-Hour Secondary Standard is 0.50 parts per million

^{*}Non-overlapping averages areafer than the Standard.

1977 TOTAL SUSPENDED PARTICULATES

(MICROGRAMS PER CUBIC METER)

STATION	ADDRESS	NUMBER OF SAMPLES			HIGHEST SAMPLES				ANN	ANNUAL STATISTICS		
		JATOT	>150 UG M3	>260 UG M ³	lat	2 nd	3rd	4 th	GEOMETRIC MEAN	STD GEO. DEVIATION		
REGION 67 METROPOLITAN	CHICAGO INTERSTATE (ILL.	- IND.)										
Lewis Site Headquarters Site	Waukegan-Com Ed Waukegan-Com Ed	116 129	5 2	0	197 176	178 167	173 138	159 136	56 46	1.67 1.76		
REGION 70 METROPOLITAN	T. LOUIS INTERSTATE (ILL	- MO.	2					İ				
Granite City	19th and Adams	24	9	0	233	198	171	170	•			
REGION 72 PADUCAH-CAIRO	INTERSTATE (ILL KY.)						l					
Station 10 Station 11	Massac County-TVA Massac County-TVA	55 55	0 2	0 0	115 186	113 151	106 135	104 107	45 54	1.59 1.49		

BDid not moet minimum stätistical culling critéria (Seo Section 4.1),

1977 SULFUR DIOXIDE

(PARTS PER MILLION)

STATION	ADDRESS	N	UMBI SAM					S (PP		ANN STATI	
	- · · · · · · · · · · · · · · · · · · ·	1 HR	24 HR	3 - HR AVGS >.5	24-HR AVGS > 14	3-HR	. AVG.	24-HF	AVG.	ARITH. MEAN	STD. GEO. DEVIATION
REGION 65 BURLINGTON-KE	OKUK INTERSTATE (1LL 1	OWA)							·-· -		
Starr Allied Mills Keystone State Hospital Limestone Ozark Hurst Boswell Gebhardt Lawndale Park Lutz Garman	Peoria-Com Ed/Cilco Peoria County-Com Ed/Cilco Pekin-Com Ed/Cilco Pekin-Com Ed/Cilco Tazewell County-Com Ed/Cilco Tazewell County-Com Ed/Cilco			000100000000	0000000000000	.273 .346 .207 .504 .289 .251 .279 .295 .236 .191 .222 .231 .217	.266 .276 .201 .296 .277 .244 .243 .289 .202 .180 .187 .203 .200	.094 .078 .054 .100 .075 .068 .072 .113 .061 .049 .041	.077 .070 .042 .063 .071 .061 .044 .079 .054 .047 .040	.011 .009 .007 .009 .010 .008 .008 .009 .009 .009 .009	
REGION 67 METROPOLITAN Lewis Site Headquarters Site REGION 71 NORTH CENTRAL	CHICAGO INTERSTATE (ILL. Waukegan-Com Ed Waukegan-Com Ed ILLINOIS INTRASTATE	7781 7831	i i	00	0 0	.083 .104	.077 .058	.036 .045	.031 .043	.008 .008	1.73 1.67
DePue - SW Plant DePue - White City REGION 72 PADUCAH-CAIRO	Bureau County-Mobil Chemical Bureau County-Mobil Chemical INTERSTATE (ILL Ky.)			1 0	2 2	.512 .383	.403 .306	.205 .162	.179 .157	.018 .021	2.58 2.79
Station 10 Station 11 Station 16 Station 17 Station 18 Station 19	Massac County-TVA	8683 8698 8722 8718 8705 8727		2 1 1 0 3	200010	1.13 .70 .57 .37 .53 .62	.61 .48 .47 .35 .51	.27 .14 .10 .10 .22	.20 .11 .09 .06 .12	.010 .009 .009 .007 .009 .010	
REGION 75 WEST CENTRAL New City Cascade Edinburg Sangchris Pawnee Clark Kincaid Jeisyville Clear Creek Zenobia	Sangamon County-Com Ed Sangamon County-Com Ed Sangamon County-Com Ed Christian County-Com Ed Christian County-Com Ed Sangamon County-Com Ed Christian County-Com Ed	7664 7858 7734 7682 7745 7766 7721 7766 7622 7648		000000000	000000000	.214 .225 .230 .224 .212 .287 .287 .208 .334 .245 .185	.213 .217 .153 .136 .182 .228 .186 .175 .190 .173	.057 .056 .059 .048 .069 .068 .045 .046	.046 .055 .045 .047 .039 .052 .041 .048 .042 .037	.009 .010 .009 .009 .008 .008 .009 .009	

7.0 AMBIENT METALS DATA

7.0 AMBIENT METALS DATA

Airborne concentrations of various metals are of concern for several reasons: they are generally associated with particles in the respirable size range, many possess known toxic properties and they can act as catalysts in certain atmospheric reactions. Ambient concentrations of metals or metals compounds are derived from a number of sources including: natural, indigenous to soils; industrial, in particular the metals processing industry; and transportation, related to vehicular emissions and erosion of road surfaces.

The health effects of measured ambient concentrations of metals are not well defined at present and there currently exists no air quality standards for any metals or metals compounds. However, the USEPA has proposed a National Ambient Air Quality Standard for lead of 1.5 $\mu g/m^3$ (calendar month average), with final establishment of this standard awaiting further review.

This section presents the results of statewide high-volume (hi-vol) sampling for ambient concentrations of iron (Fe), zinc (Zn), lead (Pb), copper (Cu), cadmium (Cd), arsenic (As), manganese (Mn), nickel (Ni) and chromium (Cr). The data has been summarized by Air Quality Control Region and is presented as an arithmetic average value in micrograms per cubic meter. It should be noted that some values are monthly composites, while others are the result of an analysis of individual hi-vol filters.

The highest concentrations of ambient metals were generally found to exist in industrial areas and, in particular, in areas impacted by emissions from iron and steel making operations. In addition, elevated levels of lead were measured in some areas characterized by high traffic density. Lowest concentrations of metals were found in non-urban areas where total suspended particulate measurements have been historically within the air quality standards.

In 1978, the metals sampling program will greatly expand in scope. Both the number of samples analyzed and the number of metals tested will be increased. This expanded program will allow for a more complete analysis of ambient metals concentrations in Illinois.

1977 AMBIENT METALS CONCENTRATIONS (UG/M³)¹

STATION	ADDRESS	no. of Samples ²	TSP ³	Fo	Zn	РЪ	Cu	Cd	As	Mn	Ni	Cr
65 BURLINGTON-KEOKUK IN East Peoria Galesburg Pekin Peoria Peoria Peoria Peoria Peoria Peoria 66 EAST CENTRAL ILLINOI	235 E. Washington Main Street 531 Court 610 N. E. Jefferson 2711 S. W. Jefferson 1604 Detweiller Bradley University	37 4 5 5 4 5	100 59 101 101 87 63 74	1.33 0.78 1.58 1.25 1.13 0.86	0.17 0.05 0.17 0.14 0.14 0.05 0.13	0.31 0.37 0.77 0.45 0.26	7.36 0.08 0.13 0.08 0.38 0.23 0.09		.003 .001 .002 .004 .003 .002			
Champaign	Washington and Madison 2125 South First Street INTERSTATE (ILL IND.)	5 3	77 77	0.97 0.74		0.53 0.22	0.09 0.24		.001 .001			
Addison Arlington Heights Bedford Park Bedford Park Bensenville Bensenville Blue Island Bradley Calumet City Cary Chicago:	130 West Army Trail Road 33 S. Arlington Hts. Rd. 6535 South Central 6700 South 78th Avenue Main and York Road 375 Meyer 12700 Sacramento 610 East Liberty Street 755 Pulaski Road 1st St. & Three Oaks Road	7 6 8 8 8 8 7 6 5 6 6	59 68 62 80 97 66 86 75 75 39	0.69 0.62 1.06 1.20 1.78 0.97 1.29 1.07 1.67	0.13	0.53 0.55 0.49 0.90 0.92 0.55 0.46 0.50 0.39	0.16 0.04 0.07 0.10 0.14 0.07 0.03 0.11 0.05		.001 .003 .004 .002 .002 .003	0.02 0.05 0.12	.002 .001 .002	.003 .008
Addams School Anthony Elementary Austin West High School Calumet High School Carver High School Chicago Vocational H.S. Clay Elementary School Cooley Vocational H.S. Crib Edgewater Farr Dormitory Fenger Junior College G.S.A. Building Hale Elementary School Kelly High School Lakeview High School Lindblom High School Lindblom High School Logan Square Medical Center South Water Plant Steinmetz High School Stevenson Elementary Sch. Sullivan High School Taft High School Von Steuben High School Washington High School	10810 South Avenue "H" 9800 South Torrence Avenue 118 North Central 8131 South May Street 801 East 133rd Place 2100 East 87th Street 13231 South Burley Avenue 1225 North Sedgwick 68th St. & Lake Michigan 5358 North Ashland Avenue 3300 South Michigan Avenue 11220 South Wallace 538 South Clark 6140 South Clark 6140 South Melvina Avenue 4136 South California Avenue 4136 South California Avenue 5015 Blackstone 4015 North Ashland Avenue 6130 South Wolcott Avenue 2940 W. Courtland Avenue 1947 West Polk 3300 East Cheltenham Place 3030 North Mobile Avenue 6631 North Bosworth Avenue 6631 North Bosworth Avenue 5625 North Natoma Avenue 5039 North Kimball Avenue 3500 East 114th Street	80 50 70 20 80 80		6.50 3.31 1.49 0.80 2.49 1.56 1.51 2.15 1.83 1.86 1.34 1.36 1.33 1.20 3.66 1.31 1.25 0.80 0.69	O.23	0.60 0.35 0.45 0.45 1 N U 0.64 0.645 0.55 0.55 0.55 0.48 0.45 0.49 0.53 0.35 0.35 0.44 0.51 0.49	0.94 0.752 0.458 0.55 0.71 0.243 0.55 0.50 0.59 0.38 0.42 0.53 0.55 0.38 0.55 0.38 0.55 0.55 0.55 0.55 0.55 0.55 0.55 0.5	.003 .004 .002 .003 .002 .002 .002 .002 .003 .003	.006 .004 .005 .004 .005 .008 .004 .005 .004 .005 .004 .005 .004 .005 .004 .004	0.04 0.03 0.02	.018 .011 .008 .007 .010 .008 .020 .009 .008 .131 .007 .011 .005 .011 .009 .011	

^{1&}lt;sub>Metals</sub> values expressed as annual arithmetic mean.

 $[\]mathbf{2}_{\text{C}}$ denotes monthly composite of hi-vol filters, all others are an analysis of individual filters.

³For monthly composites this represents the annual arithmetic mean, all others are the arithmetic mean of only those filters analyzed for metals.

1977 AMBIENT METALS CONCENTRATIONS (UG/M³)¹

STATION	ADDRESS	NO. OF SAMPLES ²	TSP3	Fe	Zn	РЬ	Cu	Cd	As	Mn	Ni	Cr
Chicago Heights Chicago Heights Cicero Crete Crystal Lake Des Plaines Elgin Elmourst Evanston Flossmoor Frenklin Park Glenview Harvey Hillside Island Lake Joliet Joliet Joliet Joliet Joliet Joliet Joliet Joliet Hacook McCook M	450 State Street Dixie Highway and 10th St. North and Elizabeth Streets Franklin and Caroline Sts. 1755 South Wolf Road 1002 North Liberty 118 Schiller 1454 Elmwood 999 Kedzie Avenue 3400 North Rose Street 1930 Prairie Street 1930 Prairie Street 157th Lexington Wolf Road and Harrison Island Lake Grade School 5 East Yan Buren Midland and Campbeil 1425 North Broadway Copperfield and Briggs Joliet & Benton Streets 1216 Houbolt Street Will County Health Dept. 121 East Sheridan Place 5th and Madison 50th and Glencoe Route 66 and Lawndale 15202 Crawford Avenue 10940 Front Street 432 East Main Street 9111 Waukegan 175 Jackson Street 8955 Greenwood Avenue 1850 Lewis Avenue 834 Lake Street 133rd and LaGrange Road 1000 Quentin Road 1000 Park Avenue 1005 Eastern Main Street Lathrop and Oak Avenue Well #2 Pump Station Naperville Road 7701 Lincoln Avenue 4401 Demster 60th and 74th Avenue 106 Utica Golf and Jackson 2200 Brookside DuPage County Airport 128 West McConnell Street 201 Reber Street 9th Street and Central Ave. South Joliet Street 112 Willow Road	2664665866566867456668754677676266665368885878778678	1 64 8 5 3 4 4 6 8 8 7 7 3 2 9 8 4 5 9 2 3 4 4 9 5 2 2 4 7 8 6 6 8 5 6 7 8 5 6 6 6 8 5 6 7 8 5 6 6 6 8 5 6 7 8 5 6 6 6 8 5 6 7 8 5 6 6 6 8 5 6 7 8 5 6 6 6 8 5 6 7 8 5 6 6 6 8 5 6 7 8 5 6 6 6 8 5 6 7 8 5 6 6 6 8 5 6 7 8 5 6 6 6 8 5 6 7 8 5 6 6 6 8 5 6 7 8 7 8 6 7 8 7 8 7 8 7 8 7 8 7 8 7 8	0.99 0.80 0.60	0.63 0.04 0.02 0.08 0.12 0.12 0.13 0.12 0.15 0.12 0.17 0.04 0.07 0.07 0.07 0.07 0.07 0.07 0.0	0.559 0.179 0.457	0.05 0.04 0.07 0.13 0.07 0.13 0.05 0.05 0.05 0.07 0.10 0.07 0.10		.001 .002 .002 .002 .003 .002 .003 .003 .003	0.02 0.02 0.02 0.02 0.03 0.01 0.02	.002 .002 .003 .001 .001 .002 .002 .002 .002	.006 .012 .006 .007 .011 .005

^{1&}lt;sub>Metals</sub> values expressed as annual arithmetic mean.

 $[\]mathbf{2}_{\text{C}}$ denotes monthly composite of hi-vol filters, all others are an analysis of individual filters.

 $³_{\text{For monthly composites}}$ this represents the annual arithmetic mean, all others are the arithmetic mean of only those filters analyzed for metals.

1977 AMBIENT METALS CONCENTRATIONS (ug/m³)¹

STATION	ADDRESS	NO. OF SAMPLES ²	TSP ³	Fo	Zn	РЬ	Cu	Cq	As	Mn	Ni	Cr
68 METROPOLITAN DUBUGUS Galena 69 METROPOLITAN GUAD C	E INTERSTATE (ILL WIS. 311 South Main Street ITIES INTERSTATE (ILL	5	89	1.64	0.13	0.45	0.04		.003			
East Moline Hilan Moline Moline Rock Falls Rock Island Rock Island	915 16th Avenue 125 West 2nd Avenue 619 16th Street 3600 23rd Avenue 101 12th Avenue 1528 3rd Avenue 1400 25th Avenue 110 West 5th Street UIS INTERSTATE (ILL MO	7 7 7 7 6 6 7 3	75 93 61 58 64 80 56 80	0.85 0.71 0.62 1.74 0.91 0.55	0.05	0.37 0.28 0.35 0.68 0.26	0.14		.001 .002 .002 .001 .003 .001 .001			en en Agusta (de Paul Seria) (de la companya de la
Alton Alton Belleville Cahokia State Park Collinsville Columbia East St. Louis Edwardsville Granite City	103 East 3rd Street 2708 Edwards 101 South Illinois Business Route 40 115A West Main 208 South Rapp 7 Collinsville Avenue Main and Purcell 2000 Edison Avenue 23rd and Madison 3210 East 23rd 2001 East 20th 15th and Madison Roosevelt and Rock Road 2040 Johnson Road East 23rd and Nameoki Norfolk and Western 54 Walcott	873886358787788768	105 106 110 109 95 109 111 77 128 151 116 198 185 147 110 111	2.46 1.76 1.65 1.23 1.11 2.46 0.96 6.14 9.78 2.89 0.32 4.48 4.36 3.03 2.80 6.76	0.28 0.72 0.21 0.21 0.14 0.09 0.74 0.53 1.67 0.70 1.047 0.35 0.26 0.23 0.33	1.39 0.70 0.55 0.38 0.79 0.44 1.09 0.76 2.08 2.08 1.03 0.41	0.27 0.23 0.14 0.20 0.22 0.18 0.31 0.25 0.25 0.21 0.28 0.29 0.23 0.23		.006 .006 .002 .004 .003 .008 .002 .013 .010 .006 .009 .013 .010			
Granite City Granite City Granite City Wood River 71 NORTH CENTRAL ILLING DePue Hennepin Oglesby Ottawa	DIS INTRASTATE 1401 Marquette 5th and High 217 Portland Avenue 211 East Main	6 7 3 5	55 63 128 58	0.86 2.21	0.27 0.07 0.07	0.26	0.41 0.18 0.18		.002 .003			,
72 PADUCAH-CAIRO INTERS Metropolis	STATE (ILL KY.) Massac County Hospital	2	181			0.53			.004			
12	-BELOIT INTERSTATE (ILL. 200 South 4th Street 2525 Ohio 126 South 1st Street	- WIS.) 6 5 5	51 44 57	0.63 0.59 1.09	0.06 0.06 0.18	0.37 0.40 0.49	0.09 0.07 0.07		.002 .001 .002			

Imetals values expressed as annual arithmetic mean.

 $[\]mathbf{2}_{\text{C}}$ denotes monthly composite of hi-vol filters, all others are an analysis of individual filters.

³For monthly composites this represents the annual arithmetic mean, all others are the arithmetic mean of only those filters analyzed for metals.

1977 AMBIENT METALS CONCENTRATIONS (UG/M³)¹

STATION	ADDRESS	NO. OF SAMPLES ²	TSP ³	Fe	Zn	Pb	Cu	Cq	As	Mn	Ni	Gr
74 SOUTHEAST ILLINOIS Carbondale Effingham Martan Mt. Vernon 75 WEST CENTRAL ILLINO	INTRASTATE 306 West Main Street 1015 South Willow 2209 West Main Street 601 North 18th Street	3 3 7 7	84 86 83 70	1.00	0.10 0.08 0.04 0.05	0.43 0.26	0.11 0.25 0.17 0.07		.002 .001 .002 .001			
Decatur Decatur Decatur Decatur Decatur Decatur Decatur Decatur Petersburg Quincy Quincy Springfield	22nd and Geddes 600 East Garfield Jasper and Orchard 750 East Lake Shore Drive 29th and Locust Condit Street 24th and Locust 7th and Jackson Streets 9th and Vermont Sewage Plant 224 West Adams	6 4 6 4 1 4 2 5 4 5 5 5	140 93 116 117 155 138 184 84 68 85	0.96 2.16 1.03 1.93 1.91 1.33 1.09 1.27 1.09	0.09 0.09 0.12 0.12 0.14 0.08 0.08	0.58 0.66 0.60 1.17 0.35 0.43 0.42 0.53	0.20 0.14 0.19 0.10 0.20 0.26 0.26 0.18 0.25 0.25		.003 .002 .003 .003 .003 .002 .003 .001			

Metals values expressed as annual arithmetic mean.

 $^{2\}bar{c}$ denotes monthly composite of hi-vol filters, all others are an analysis of individual filters.

³ For monthly composites this represents the annual arithmetic mean, all others are the arithmetic mean of only those analyzed for metals.

APPENDIX A

STATISTICAL METHODS

I. LOG-NORMAL STATISTICS

The following is a list of symbols used in the various formulas:

n - the total number of samples used

X_i - the concentration of each individual sample

In - the natural logarithm function (log to base e)

exp - the exponential function (inverse of the ln function)

 \mathbf{r} - the total summation of the appropriate values

x - arithmetic mean

xg - geometric mean

Sg - standard geometric deviation

Arithmetic Mean:

$$\overline{\hat{\mathbf{x}}} = \frac{1}{\hat{\mathbf{n}}} \mathbf{x} \mathbf{x}_{\hat{\mathbf{n}}}$$

Geometric Mean:

$$\overline{x}g = \exp\left(\frac{1}{n}\sum_{i}1_{n}x_{i}\right)$$

The arithmetic mean is always equal to or greater than the geometric mean.

Standard Geometric Deviation:

Sg = exp
$$\left[\frac{1}{n-1} \left(\frac{z}{i} (\ln x_i)^2 - \frac{1}{n} (\frac{z}{i} \ln x_i)^2 \right) \right]^{1/2}$$

Arithmetic Mean to Geometric Mean:

The following relationship exists between the arithmetic mean, geometric mean, and standard geometric deviation. By knowing two of the values, the third can be calculated.

$$\overline{z}g = \frac{X}{\exp (0.5 (\ln Sg)^2)}$$

Maximum and Second High Predicted 24-Hour Concentrations:

For a geometric mean $\overline{X}g$ and standard geometric deviation Sg, based on a log-normal distribution of pollutants collected throughout the year, the maximum and 2nd high predicted for the year out of a total of 365 possible data values is given by:

$$C_{\text{max}} = \overline{x}g (Sg)^{2.94}$$

$$C_{\text{2nd}} = \overline{x}g (Sg)^{2.63}$$

Example 1: For
$$\chi g = 70 \ \mu g/m^3$$
 and $Sg = 1.5$
 $C_{max} = 70 \ \mu g/m^3 \ (1.5)^2.92 = 231 \ \mu g/m^3$
 $C_{2nd} = 70 \ \mu g/m^3 \ (1.5)^2.63 = 203 \ \mu g/m^3$

II. DANIEL'S TEST FOR TRENDS USING SPEARMAN RANK CORRELATION COEFFICIENT

The test statistic, p, is given by:

$$\rho = 1 - \frac{6T}{\pi(\pi^2 - 1)}$$

where

$$T = \sum_{i} (R(x_i) - i)^2$$

n is the number of years in the trend.

 $R(x_i)$ is the rank of the concentration x_i , 1 being the lowest concentration.

i is the order of the year, 1 being the first year.

Compare $|\rho|$ with the Spearman Statistic, Wp, as given in the table below for the 90% confidence level. The interpretation of this significance level is that if a trend does not exist, 10 out of 100 times this test will falsely predict a trend.

Number of Trend Years 4 5 6 7 8 9 10Wp, 90% confidence level .8000 .8000 .7714 .6786 .6190 .5855 .5515
The trend is determined to exist if $|\rho| > Wp$

For $\rho > 0$ then the trend is upward

For $\rho < 0$ then the trend is downward

To illustrate the use of this procedure, two examples are given.

Example 2:

Year	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>	<u>1974</u>	<u>1975</u>	<u>1976</u>
Data (x ₁) R (x ₁)	112	104 6	85 5 3	78 3	81 4	72 2	66 1
i	i	2	3	4	5	6	. 7
η = 7							
$T = (7-1)^{\frac{1}{2}} + (6-1)^{\frac{1}{2}}$	5-2) ² + (5-3	3) ² + (3-	-4) ² + (4	-5) ² + (2-6) ² +	(1-7) ² =	= 110
	,c	= 1 -	6 (110)	=8	857	•	

 $|\rho|$ = .8857 which is greater than Wp for η = 7 from the Table, thus the trend is established. Since ρ is negative, the trend is downward.

Example 3:

<u>Year</u>	75	<u>1970</u>	1971	1972	1973	1974	<u>1975</u>	1976
Data (x _i) R (x _i) i		91 4 1	80 2 2	66 1 3	97 7 4	93 6 5	92 5 6	85 3 7
η = .7								
$T = (4-1)^2 +$	(2-2)	² + (1-3)2 + (7-	4) ² + (6	-5) ² + (5-6) ² +(3 - 7) ² =	40
	•	£	= 1 - 7	6 (40) (72 + 1	= .3143)	3		

 $|\rho|$ = .3143 which is less than Wp for n = 7 from the Table. Thus no trend can be determined.

III. PRECISION OF NONCONTINUOUS SAMPLING

The following formulas are from Hunt (1972) and provide the difference between the geometric mean and the upper and lower confidence limits as a fraction of the geometric mean.

Lower limit fraction

$$m_1 = 1 - \exp \left[-t.025 \frac{1 \pi \text{ Sg}}{\pi 1/2} \left(1 - \frac{\pi}{N} \right) \right]^{1/2}$$

Upper limit fraction

$$m_2 = 1 - \exp \left[t_{.025} \frac{1 \bar{\eta} \text{ Sg}}{\bar{\eta} \frac{1/2}{1/2}} \left(1 - \frac{\eta}{N} \right) \right]^{1/2} -1$$

Sg is the geometric standard deviation

n is the number of samples taken during the year

N is the total possible number of samples (for 1 year, N = 365)

t 025 is the "t" statistic for n-1 degrees of freedom at the 95% confidence level

The lower confidence limit is obtained by multiplying the geometric mean by \mathbf{m}_1 and substracting the result from the geometric mean. Likewise the upper confidence limit is obtained by multiplying the geometric mean by \mathbf{m}_2 and adding the result to the geometric mean.

Example 4: Geometric mean = 66

Geometric standard deviation = 1.67

Number of samples n = 61

"t" statistic for 60 degrees of freedom t.025 = 2.000

$$m_1 = 1 - \exp \left[-2.000 \frac{.513}{61 \cdot 1/2} \left(1 - \frac{61}{365} \right)^{1/2} \right] = .113$$

 $m_2 = \exp \left[2.000 \frac{.513}{61 \cdot 1/2} \left(1 - \frac{61}{365} \right)^{1/2} \right] - 1 = .127$

lower limit = 66 - (.133) 66 = 59

upper limit = 66 + (.127) 66 = 74

Thus, because sampling occurred only once every six days, the true annual mean is between 59 $\mu g/m^3$ and 74 $\mu g/m^3$ at the 95% confidence level.

APPENDIX B

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